Ypsilanti, Michigan

MODEL

505 TRANSPONDER

REGENCY

Regency

AVIONICS...

A DIVISION OF REGENCY ELECTRONICS, INC.

AIR TRAFFIC CONTROL, ALTITUDE AND IDENTITY

RECEIVER-TRANSMITTER SYSTEM

MODEL

505 TRANSPONDER

OPERATING AND MAINTENANCE

INSTRUCTIONS

Revised
March. 1965

Manufactured By:

REGENCY AVIONICS
A Division of REGENCY ELECTRONICS, INC.
7900 Pendleton Pike
Indianapolis, Indiana 46226

REGENCY ELECTRONICS SERVICE BULLETIN

March 23, 1967

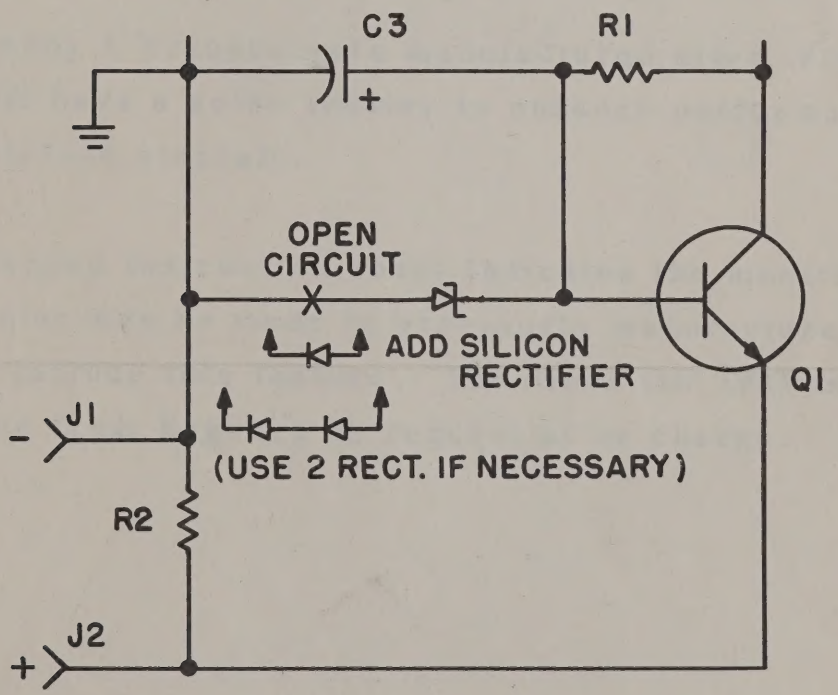
SUBJECT: REGENCY MODEL 102 POWER PACK

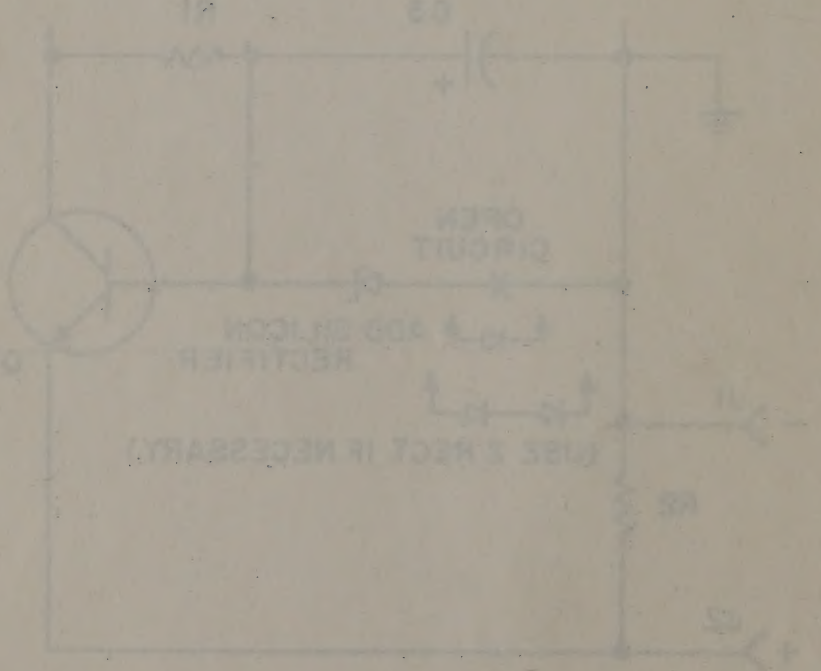
Some instances have been found where the output voltage from the Model 102 Power Pack is insufficient to fully charge the Model 601 Battery Pack.

The output voltage from the Power Pack should be between 15 and 16 volts, measured at the output plug.

If the output voltage is less than 15 volts, one or two silicon rectifiers should be added in series with the ground lead of the 15 volt zener diode, as required to raise the output voltage to between 15 and 16 volts. The cathode of the silicon rectifier should go to ground.

The rectifier should have ratings greater than 200 ma, 50 volts. Any one of the 750 ma rectifiers of the type used in television receivers should prove satisfactory.





AVIONICS ... manufacturers of Aviation Electronics
A DIVISION OF REGENCY ELECTRONICS, INC.

March, 1966

TO: All Avionics Distributors

SUBJECT: Standby 1 Noise Limiter

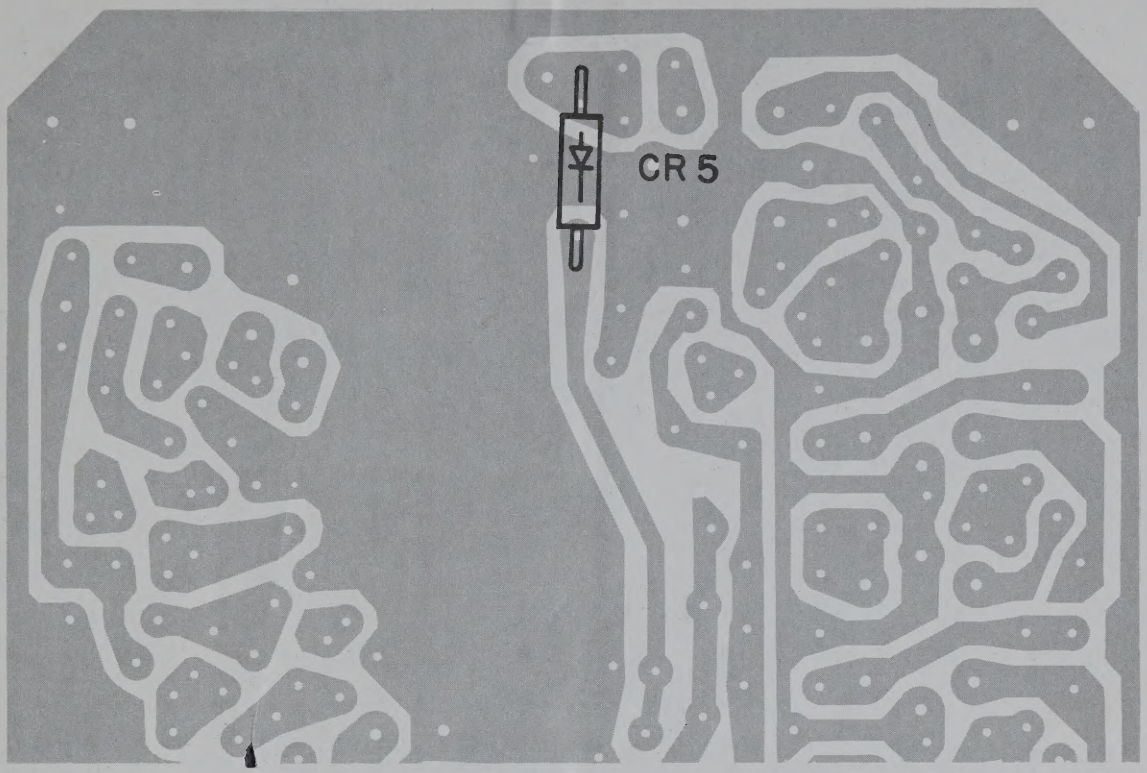
SERVICE AND MODIFICATION BULLETIN
REGENCY STANDBY 1

All Standby 1 Transceivers manufactured after this date will have a noise limiter to enhance performance in unshielded aircraft.

The attached instruction sheet indicates the modification that may be made to previously manufactured sets to include this feature. The diode (IN 198) is available from Regency on request at no charge.

1N198—

7900 PENDLETON PIKE, INDIANAPOLIS, INDIANA 46226 TEL. (A.C. 317) 547-3581



To install CR 5 cut lead lengths approx. 3/16" long and solder to copper side of P. C. Board keeping the diode as close to the board as possible. (Note Polarity) CAUTION -- EXCESSIVE HEAT MAY DAMAGE THE DIODE.

COMPONENT PART CHANGES

The following revisions have been incorporated in the REGENCY MODEL 505 TRANSPONDER:

R3227 560Ω changed to 1000Ω

CR5001 CER 68A added from junction of C5004 & L5001 to ground.

+12 & -12 voltages are factory adjusted to +13 & -13 V. (approximately).

2 W

1 V

2 W

1 V

003.1

BUTLER AVIATION

AVIONICS TEARDOWN REPORT

1. ITEM DESCRIPTION _____

PART NUMBER _____ SERIAL NUMBER _____

REMOVED FROM A/C _____ POS. _____ TSO _____ DATE _____

REASON FOR REMOVAL _____

_____

_____

_____

2. RECEIVING INSPECTION REMARKS: _____

_____

_____

COMPLAINT VERIFIED? _____ WARRANTY REPAIR? _____

3. DESCRIPTION OF REPAIR: _____

_____

_____

PARTS USED _____ _____

_____ _____

_____ _____

_____ _____

_____ _____

SPAN EAST P. O. # _____ REPAIR AGENCY W. O. # _____

SERVICEABLE UNIT SHIPPED TO _____

DATE _____

RETURN COMPLETED FORM TO: SPAN EAST AIRLINES
WILLOW RUN AIRPORT
HANGAR #2
YPSILANTI, MICHIGAN 48197

ATTENTION: QUALITY CONTROL

TABLE OF CONTENTS

Table of Contents (Cont.)

Table of Contents (Cont.)

Table of Contents (Cont.)

Table of Contents (Cont.)

LIST OF ILLUSTRATIONS

List of Illustrations (Cont.)

SECTION I

INTRODUCTION

1-1. PURPOSE

The Regency Model 505 ATC TRANSPONDER is an altitude and identification transmission system designed for use in general aviation aircraft. The TRANSPONDER in conjunction with ground interrogation and decoding equipment supplies aircraft altitude and identification information to the air traffic controller.

Altitude information is reported in 100 foot increments and is transmitted upon receipt of a Mode C (21 microsecond) ground interrogation. The pilot adjusts the code selector on the CONTROL HEAD (505 CH) to the aircraft identification code assigned by the air traffic controller. The aircraft identification code is transmitted upon receipt of a Mode A (8 microsecond) ground interrogation. The air traffic controller may request an identification of aircraft position. Upon receiving the request, the pilot depresses the IDENT switch on the CONTROL HEAD (505 CH) which enables an additional pulse (SPI pulse) in subsequent Mode A Reply trains. Transmitting the SPI pulse causes the appearance of the target on the air traffic control display to be unique, which facilitates easy recognition of the aircraft by the air traffic controller. After sufficient time has elapsed for the controller to identify the target, the SPI pulse is automatically omitted from further Mode A replies.

1-2. GENERAL INFORMATION

The Regency Model 505 TRANSPONDER employs semiconductors and printed circuits to reduce size, weight, and power consumption. Vacuum tubes are used only in the transmitter and receiver local oscillator circuits.

The RECEIVER-TRANSMITTER (505 RT) circuits of the TRANSPONDER are packaged in a 3/8 ATR short case. The internal supporting members are arranged for easy access to the components. Shock mounting is not ordinarily necessary for the RECEIVER-TRANSMITTER (505 RT); however, if unusual shock or vibration conditions are anticipated, standard Regency SHOCK MOUNT (505 SM) may be used.

The RECEIVER-TRANSMITTER (505 RT) may be installed in any position, although an upright position is preferable.

1-2. General Information (Cont.)

The ANTENNA (505 A) is designed to be mounted on the bottom of the aircraft fuselage. The Model 505 TRANSPONDER is furnished as either a 13.75 VDC or a 27.5 VDC unit. No AC power is required.

1-3. SPECIFICATIONS

a. RECEIVER TRANSMITTER (505 RT)

Transmitter Frequency:	1090mc ± 3mc
Receiver Frequency:	1030mc ± 0.3mc
Altitude: Operation	45,000 feet (maximum)
Reporting	63,000 feet
Temperature:	-15°C to +55°C (operating)
	+60°C (operation for a short period)
	-50°C to +71°C (storage-non-operating)
Power:	13.75 v.dc ± 10% at 2.6 amperes (no signal),
	3.0 amperes at maximum duty cycle
	27.5 v. dc ± 10% at 1.3 amperes (no signal)
	1.5 amperes at maximum duty cycle
Transistors:	51
Vacuum Tubes:	2
Transmitter Power Output:	500 watts peak (nominal) ± 3db
Transmitter Frequency Stability:	± 3 mc
Receiver Sensitivity:	-72 dbm (minimum)
Receiver Bandwidth:	3db down, greater than 6 mc
	60db down, less than 50 mc

1-3. Specifications (Cont.)

Reply Codes:	Mode C interrogation-ICAO standard 100 foot increment height code.
	Mode A interrogation, -Codes 0000 through 7777 (4096 codes) plus the SPI pulse.
Spike Suppression:	Reject pulses with a duration of less than 0.3μ sec up to an input of 6db above miniumum triggering level.
Side Lobe Suppression:	Three-pulse
Side Lobe Suppression Selectivity:	2.0 ± 0.15μ sec - 90% suppression
	2.0 ± 1.0μ sec - no suppression
Decoding Selectivity:	Accept pulses spaced 8.0 ± 0.20 microseconds and 21.0 ± 0.20 microseconds
	Reject pulses spaced 8.0 ± 1.0 microseconds and 21.0 ± 1.0 microseconds
Reply Pulse Spacing Accuracy:	± 0.1 microsecond, except that the tolerance of any pulse with respect to any other pulse in the train shall not exceed ± 0.15 microsecond
Weight:	9.75 pounds
Size:	3-9/16 inches wide, 7-9/16 inches high, 12-3/4 inches deep

b. CONTROL HEAD (505 CH)

Weight:	1.0 pounds

1-3. Specifications (Cont.)

	Front Panel Size:	2-7/16 inches wide by 2-7/8 inches high
	Overall Length:	5-3/8 inches
c.	ANTENNA (505 A)	
	Weight:	0.1 pounds
	Size:	4.0 inches long with 1 inch square mounting base.
d.	FUNCTION TESTER (505 FT)	
	Weight:	0.48 pounds
	Size:	4-1/2 X 3-5/8 X 1-11/16
	Power	0.5 amperes @ 13.75 VDC maximum 0.25 amperes @ 27.5 VDC maximum
	Connectors:	Type C (antenna line)
	Transistors:	3

SECTION 2

INSTALLATION

2-1. GENERAL

This section contains instructions for the installation of the Regency Model 505 TRANSPONDER in an aircraft and pre-installation tests if desired.

2-2. PRE-INSTALLATION TESTS

Refer to paragraph 5-2 for the test equipment required.

WARNING

Exercise extreme caution when the TRANSPONDER power supply is operative. Personal contact with the high voltage circuits could result in serious injury or death.

a. Power Supply Tests

1. The CONTROL HEAD (505 CH) used with the Regency Model 505 TRANSPONDER should be connected to the RECEIVER-TRANSMITTER (505 RT) as shown in figure 30. Connect the power input pins to a regulated dc power supply (Deltron Model 607 or equivalent). The power input pins are D and J of the CONT/PWR jack (J1001) on the RECEIVER-TRANSMITTER (505 RT) front panel or the labeled cable leads when using Regency CABLE ASSEMBLY (505 CAT).

2. Connect the positive terminal of the power supply to pin D and the ground (negative) terminal to pin J.

3. Set the power supply output voltage to 13.75 volts or to 27.5 volts.

4. Set control switch to SBY and note the power supply output current reading. The normal current should be approximately 2 amperes for a 14 VDC unit and 1 ampere for a 28 VDC unit with no interrogation signal.

5. Measure the dc voltage levels at the points shown in figure 19 & 20. (A Simpson 260 VOM or equivalent should be used for these measurements.) All voltage measurements are made using the chassis as the ground connection. If the voltages are low, turn R5001, see figure 20, clockwise until correct readings are obtained. Turn R5001 counterclockwise if voltages are high.

6. Measure the vacuum tube filament voltage between the brown and black wires to V1101 (Local Oscillator board). Measure the voltage with a 5000 ohm per volt ac voltmeter (Simpson 260 or equivalent). The nominal voltage as read by this type of meter should be 7.1 volts. A voltage reading of 6.5 volts between brown-white and black wires to Z1001 (TRANSMITTER) should be obtained.

b. Receiver Tests

The receiver portion of the RECEIVER-TRANSMITTER (505 RT) should be tested as follows:

1. Connect the Model 505 TRANSPONDER to the test equipment as shown in figure 37.

2. Set the Mode switch on the CONTROL HEAD (505 CH) to A-C.

3. Set the frequency of the R.F. signal generator to 1030 mc.

4. Set the controls of the double pulse generator to modulate 1030 mc and to provide 21 microsecond-spaced pulses at 200 interrogations per second as shown in figure 3.

5. Observe the reply pulse train on the oscilloscope.

c. Receiver Sensitivity and Bandwidth Tests

The receiver sensitivity should be -72 to -80 dbm at normal sensitivity using the test setup shown in figure 35. To check the receiver bandwidth, tune the r-f signal generator ± 3 mc from 1030 mc and adjust the input signal amplitude at each frequency until a reply pulse train is transmitted 90% of the time. The sensitivity at the ± 3 mc frequencies should be within 3 db of the sensitivity at 1030 mc. If the receiver sensitivity is low, refer to Section 5, paragraph 5-6.

d. Transmitter Tests

The test setup is the same as that used for the receiver tests (figure 37). Perform the tests as follows:

1. Perform steps 1 through 5 of paragraph b to interrogate the RECEIVER-TRANSMITTER, except interrogate at a prf of 500.

2. Measure the transmitter output power and frequency. The peak output power should be 500 watts. The output frequency should be 1090 ± 2.5 mc.

2-2. Pre-Installation Tests (Cont.)

3. The reply pulse train on the oscilloscope should appear as shown in figure 3, except that information pulses will not be present for installations with no altitude transducer. Framing pulses should be spaced 20.3 ± 0.1 microseconds. The pulse widths should be 0.45 ± 0.1 microsecond.

4. Set the controls of the double pulse generator to modulate 1030 mc and to provide 8-microsecond spaced pulses at 500 interrogations per second as shown in figure 3.

5. Set the CODE SELECTOR switch on the CONTROL HEAD (505 CH) to code 7777. Check the following:

(a) Two framing and twelve information pulses should be transmitted.

(b) Pulse spacing should be 1.45 ± 0.10 microseconds.

(c) Pulse widths should be 0.45 ± 0.1 microsecond.

6. Press the PUSH TO IDENT button on the CONTROL HEAD (505 CH) and observe the following:

(a) The IDENT pulse should be spaced 4.35 ± 0.1 microseconds from the last framing pulse.

(b) The IDENT pulse width should be 0.45 ± 0.1 microsecond.

If the Regency 505 TRANSPONDER does not function properly during any of these tests, refer to section 5 for further tests and alignment procedures.

2-3. MOUNTING

a. RECEIVER-TRANSMITTER (505 RT)

The RECEIVER-TRANSMITTER (505 RT) may be mounted directly to the aircraft frame using the four mounting holes on the bottom panel, see figure 4, or on a SHOCK MOUNT (505 SM). The unit should be mounted in a position so that air is free to circulate around the unit and so that extreme temperature variations will not be encountered. Figure 4 shows the outline dimensions of the RECEIVER-TRANSMITTER (505 RT). For severe vibration environment install with SHOCK MOUNTS (505 SM).

b. CONTROL HEAD (505 CH)

The CONTROL HEAD (505 CH) should be mounted in an octagonal hole. The outline

dimensions and cutout for the CONTROL HEAD (505 CH) are shown in figure 5.

c. FUNCTION TESTER (505 FT)

Figure 6 shows the mounting and outline dimensions for the FUNCTION TESTER (505 FT). The unit is designed to be mounted directly to the aircraft frame. The location and mounting position are not critical. Note that the cable harness supplied will accommodate approximately 3 ft. maximum seperation between the RECEIVER-TRANSMITTER (505 RT) and the FUNCTION TESTER (505 FT). The FUNCTION TESTER (505 FT) should be mounted in a location to minimize the length of antenna cable.

d. ANTENNA (505 A)

Figure 7 shows the outline and mounting dimensions for the quarter-wave sleeved stub antenna. The ANTENNA (505 A) should be mounted on the bottom of the aircraft fuselage at the lowest point during normal level flight. The location should be free of obstructions or projections. It is important that portions of the aircraft structure or accessories do not shield the antenna from the ground station at any aircraft heading. When installation is made in fabric-covered aircraft, an artificial ground plane should be installed. The ground plane should be a 24-inch diameter circle of metal foil or other highly conductive material which is mounted to the fuselage surface with the antenna at the center of the circle.

SECTION 3

OPERATION

3-1. OPERATING CONTROLS

All operating controls for the Regency Model 505 TRANSPONDER are located on the CONTROL HEAD (505 CH) front panel (see figure 25). The CONTROL HEAD (505 CH) contains a function switch (OFF-SBY-ON-LO SENS), a mode switch (A-C-AC), 4 beacon code selector switches, an IDENT switch, a TEST switch, a TEST ON switch, a RPLY light, and 6 replaceable illuminating lamps.

a. Function Switch

The function switch at the lower left hand side of the CONTROL HEAD (505 CH) front panel has four positions:

1. OFF-No power is applied to the system.
2. SBY (Standby)-Power is applied to the system, but no replies can be transmitted.
3. ON-The transmitter replies to interrogations.
4. LO SENS-The receiver sensitivity is reduced.

b. Mode Switch

The mode switch at the lower right hand side of the CONTROL HEAD (505 CH) front panel, has three positions:

1. A-The TRANSMITTER-RECEIVER (505 RT) will reply to Mode A interrogations only.
2. C-The TRANSMITTER-RECEIVER (505 RT) will reply to Mode C interrogations only.
3. AC-The TRANSMITTER-RECEIVER (505 RT) will reply to either Mode A or Mode C interrogations.

c. Beacon Code Switch

The beacon code switches are located immediately below and on either side of the beacon code indicator window on the CONTROL HEAD (505 CH). The 4 code switch control knobs control the units, tens, hundreds, and thousands digits. Reply codes may be selected from 0000 to 7777.

Note: The Regency CONTROL HEAD (505 CH) is supplied with the units and tens

switches locked in the zero position and front blank.

d. IDENT Switch

The IDENT switch is located between the function switch and the mode switch on the CONTROL HEAD (505 CH). The switch is energized by pressing the button, which causes the Model 505 TRANSPONDER to transmit the SPI pulses for approximately 15 seconds.

e. Illuminating Lamps

The 6 illuminating lamps are located such that the code window and the nomenclature associated with the function and mode switches are illuminated for use during night operation of the aircraft.

f. TEST Switch

The test switch energizes the FUNCTION TESTER (505 FT) when the TEST ON Switch is in the ON position.

g. TEST ON Switch

The TEST ON switch controls the primary power to the FUNCTION TESTER (505 FT).

h. RPLY Light

The RPLY Light indicates that the Regency 505 TRANSPONDER is functioning correctly when the TEST switch is depressed; and it serves as an In Flight Monitor of the Transponder system.

SECTION 4

THEORY OF OPERATION

4-1. GENERAL

This section contains the theory of operation for the Regency Model 505 TRANSPONDER. Detailed block diagrams indicating signal flow are shown in figure 9. The theory is explained by the use of the block diagram and the schematic diagrams (figure 27, 28, 29 and 30).

Interrogation signals at a frequency of 1030 mc are received at the antenna of the system. These interrogation signals are applied through an RF preselector to the mixer. The interrogation signals are heterodyned with the 1090 mc local oscillator signals in the mixer. The resulting difference frequency of 60 mc is applied to the i-f strip for amplification. The 60 mc signal is then detected, amplified, and processed in the video stages. The processed video is applied to the Mode C and Mode A decoder circuits. If an altitude interrogation is received, the Mode C decoder will produce an output pulse. If an identification interrogation is received, the Mode A decoder will produce an output pulse. Depending upon whether the interrogation is Mode A or C, the identification code selector or an altitude transducer, respectively will control the encoding of the reply pulse train. The encoding circuits generate the reply pulse trains with the information pulse positions either vacant or filled. The encoder outputs are applied through the read pulse amplifier to the modulator where the reply pulses are amplified to a level sufficient to pulse the transmitter oscillator. The 1090 mc output of the transmitter is connected to the antenna through the preselector. The preselector provides RF selectivity for the receiver and provides isolation to protect the mixer crystal diode from the transmitter power.

The Model 505 TRANSPONDER has additional circuits to provide spike suppression, echo suppression, and side lobe suppression. Spike suppression is incorporated in the unit to prevent false interrogations caused by radio frequency interference of relatively short duration (less than 0.3μ sec). The spike suppression circuit, located ahead of the decoders, suppresses pulses which have a duration of less than 0.3 microsecond. Echo suppression reduces the effect of signal echoes and is used for signal level comparison purposes to determine whether the side lobe suppression (SLS)

4-1. General (Cont.)

signals should cause suppression.

Echo suppression is accompished by desensitizing the receiving section during the period immediately following a pulse. Side lobe suppression (SLS) is a means of suppressing a reply from an aircraft located in a side lobe of the ground antenna pattern. A ground installation equipped with SLS transmits a pulse 2 microseconds after the first interrogation pulse. The SLS pulse is transmitted at the same frequency as the interrogation pulses, but an omnidirectional antenna is used and the field intensity of the SLS signal is equal to or slightly greater than the field intensity of the strongest side lobe of the interrogating antenna. An aircraft located in the main lobe of the interrogating antenna receives an interrogation in which the interrogation pulses are greater in amplitude than the SLS pulse, but an aircraft located in a side lobe of the interrgating antenna receives an interrogation in which the SLS pulse is equal to or greater than the amplitude of the interrogation pulses. If the Model 505 TRANSPONDER receives the SLS pulse in the proper time and amplitude relationships with the first interrogation pulse, the reply to the interrogation is suppressed.

4-2. R-F SECTION

a. ANTENNA (505 A)

The receiving and transmitting ANTENNA (505 A) is a quarter-wave stub with a short sleeve impedance matching section.

b. Filter

The harmonic suppression filter FL1001 is low pass filter designed to attenuate the harmonics of the 1090 mc fundamental output of the transmitter. The attenuation provided reduces the level of the strongest harmonic to more than 60 db down from the level of the fundamental.

c. Transmitter Cavity

The transmitter cavity is a coaxial cavity which contains a planar triode (V4001). The planar triode is operated as a grid-pulsed oscillator at a frequency of 1090 mc. Power is extracted from the cavity by a small coupling loop which is terminated in the RF connector. The transmitter stage has output only when it receives a pulse from the modulator.

4-1. General (Cont.)

d. RF Preselector Assembly

The RF preselector assembly has three functions. One, it provides selectivity in the front end of the superheterodyne receiver to prevent reception at the image frequency (1050 mc). Two, it provides high attenuation between the transmitter output and the receiver input which allows the transmitter and receiver to use the same antenna. Three, it provides the pair of tuned circuits necessary for the local oscillator. Received signals are passed through adjustable filter sections Z1001-1, Z1001-2, and Z1001-3 to the receiver coupling post. The local oscillator signal is also induced into this post. Transmitted signals pass through the preselector to the harmonic suppression filter unaffected.

e. Local Oscillator

The local oscillator (V1101) is a tuned-plate, tuned-grid oscillator which operates at approximately 1090 mc. Power supply isolation is provided by a lumped constant choke (L1101), and a by pass capacitor (C1101). The oscillator plate and grid tanks (Z1001-4 and Z1001-5 respectively) are physically contained in the r-f preselector assembly housing.

4-3. I-F SECTION

a. Mixer

The diode mixer (CR2001) is located on the IF strip printed circuit board. The mixer diode produces the 60 mc signal which is the difference frequency resulting from heterodyning the 1030 mc received signal with the 1090 mc local oscillator signal. The detected signal is applied to the base of Q2001, the first IF amplifier stage.

b. IF Amplifier

The IF amplifier consists of five double tuned, transistor stages (Q2001 through Q2005) which are connected in the common emitter configuration. The bandwidth of the IF amplifier is approximately 6 mc.

c. Sensitivity Control

The reply triggering sensitivity can be adjusted by varying potentiometer R2002. The potentiometer varies the emitter current on the first transistor amplifier stage in the IF strip (Q2001).

4-3. I-F Section (Cont.)

d. Automatic Overload Control

The dc voltage obtained from the automatic overload control (AOC) circuit in the video section is applied to the emitters of IF amplifier stages Q2002 and Q2003. The emitter currents, and therefore, gain of these two transistors is reduced when the Regency 505 TRANSPONDER reply rate exceeds the desired rate. See paragraph 4-6-f.

e. LO Sensitivity Control

The LO Sensitivity control R2001 controls the amount of Receiver gain reduction when in LO SENS position. This reduction is normally set at 12 db.

4-4. VIDEO PROCESSING SECTION

a. Video Detector

The output of the IF amplifier is coupled to the video detector diode (CR2002). The resulting video signal is applied to emitter follower Q2006.

b. Spike Suppression

The output of Q2006 is capacitively coupled to the base of Q3301 and through a delay line (DL3301) to the base of Q3302. These two transistors and associated components comprise an AND circuit used for spike suppression. An output is obtained only when the direct coupled signal and the delayed signal are coincident. The delay line provides a 0.5 microsecond delay to insure that pulses with durations of less than 0.3 microseconds are suppressed. The delay is greater than 0.3 microseconds to compensate for pulse stretching effects which normally occur in the preceding circuit.

c. Echo Suppression

Q3101 provides both echo suppression action and output pulse width standardization. Capacitor C3104, in combination with R3106, causes the output of Q3101, to be differentiated. Additionally, during the duration of the input pulse, a charge is stored in capacitor C3104. At the end of the input pulse the charge stored in C3104 is discharged through R3106. The time constant of C3104 and R3106 is adjusted to provide the proper charge decay rate. In this manner, desensitization of Q3101 continues at a decreasing amplitude until the voltage on C3104 reaches a value equal to the quiescent emitter voltage of Q3101. Only the initial portion of the exponential discharge produced by C3104 and R3106 is used. Hence, the discharge rate is approximately linear. The gain of Q3101 is reduced for periods up to 15 microseconds duration after

each pulse, due to the discharging of the R-C network. The amount of gain reduction and the gain recovery time are functions of the signal level and can be controlled by potentiometer R3102 in the base bias network of Q3101.

d. Video Amplifier

The video amplifier consists of three capacity-coupled, amplifier stages (Q3104, Q3105, and Q3106). Video inhibiting is accomplished by applying a voltage obtained from the SLS multivibrator through Q3109 to the emitter of Q3106.

e. Time Delay Circuit

Since the power supply is transistorized, all operating voltages are applied to the circuits upon placing the control switch on the CONTROL HEAD (505 CH) to any non-off position. The function of the time delay circuit is to prevent the transmitter from being pulsed before the cathode of the planar triode (V4001) reaches operating temperature. The time delay circuit accomplishes this by disabling the video amplifier during the cathode warmup period. With the video amplifier disabled, interrogations cannot reach the decoders, and there can be no reply transmission. The time delay circuit consists of transistors Q3102, Q3103, and associated components. Upon placing the control switch in any non-off position, +12 volts is applied across three circuit elements in series, R3110, C3106, and the base emitter resistance of Q3102. The resulting current through the base emitter resistance of Q3102 causes this transistor to be switched off. The resistance of R3110 is relatively high, hence capacitor C3106 cannot immediately reach full charge. As the voltage drop across the capacitor increases, the current through the series circuit decreases. Transistor Q3102 is switched off for approximately 60 seconds, the length of time necessary for the capacitor charging current to diminish to the point where the current from the minus supply through R3112 is predominant. Since the current from the minus supply tends to cause the base to go negative, transistor Q3102 then switches on. When Q3102 switches on, the collector drops from -12 volts o nearly 0 volts. The collector of Q3202 is coupled through an emitter follower (Q3103) and R3115 to the base of Q3104, the first video amplifier stage. The resistance of R3115 is such that Q3104 is biased normally when Q3102 is conducting, but is cut off and inoperative when Q3102 is not conducting.

4-4. Video Processing Section (Cont.)

f. Delay Line Driver

The positive interrogation pulses from the last video amplifier (Q3106), and the subsequent negative pulse from the encode pulse amplifier are applied to the delay line driver. The delay line driver stage is a complimentary emitter follower that will operate with either positive or negative input pulses. The circuit consists of Q3107, a pnp transistor which is utilized for negative going pulses in parallel with Q3108, an npn transistor which is utilized for positive going pulses.

4-5. DECODING SECTION

a. Side Lobe Suppression Decoder

The SLS decoder has an effective output pulse only if an SLS pulse is received and only if this pulse has sufficient amplitude to pass through the echo suppression circuit. If the SLS pulse is more than 9db below the first interrogation pulse, the desensitizing action of the echo suppression circuit will cause the amplitude of the SLS pulse to drop below the level necessary to trigger the SLS gate generator. The decoder also determines whether the SLS pulse spacing is correct by time measurement. AND 1, consisting of CR3102 and CR3103 obtains one of its two inputs from the 0 microsecond tap on the delay line, and the other from the 2 microsecond tap on the delay line. If the SLS pulse spacing is correct, the first interrogation pulse will be in coincidence with the SLS pulse at AND 1, and there will be an output pulse from AND 1. This triggers the SLS gate generator.

b. Mode C Decoder Circuit

The Mode C decoder circuit produces an output pulse only when a Mode C interrogation is received. The circuit accomplishes this decoding by applying the interrogation pulses from the 0 microsecond tap on the delay line to one input of AND 3 (CR3105) and the interrogation pulses from the 21 microsecond tap on the delay line to the other input of AND 3 (CR3106). When a Mode C interrogation (21 microsecond pulse pair) is received and applied to the input of the delay line, the two pulses will appear in coincidence at the input of AND 3. AND 3 will produce an output pulse unless an inhibit voltage is present from the decoder suppressor (Q3111) or the mode select switch on the CONTROL HEAD (505 CH).

4-5. Decoding Section (Cont.)

c. Mode A Decoder Circuit

The Mode A decoder circuit produces an output pulse only when a Mode A interrogation is received. The circuit accomplishes this decoding by applying the Mode A interrogation pulses (8 microsecond pulse pair) from the 0 microsecond tap on the delay line to one input of AND 2 (CR3213) and from the 8 microsecond tap to the other input of AND 2 (CR3214). The two pulses will appear in coincidence at the input of AND 2. Because the two input pulses arrive in coincidence, AND 2 will produce an output pulse, unless an inhibit pulse is present from the decoder suppressor (Q3111) or the mode select switch on the CONTROL HEAD (505 CH).

4-6. GATE GENERATORS AND REPLY CIRCUITS

a. SLS Gate Generator

The SLS gate generator produces a signal to disable the video amplifier section and the decoder(s) whenever a legitimate SLS pulse is received or whenever the Regency 505 TRANSPONDER initiates a reply. The SLS gate generator is a monostable multivibrator that obtains its triggering signal from OR 1 (CR3111 and CR3112). One of the two OR 1 inputs is obtained from SLS AND 1, while the other input is the differentiated output of the mode gate emitter follower (Q3116). The SLS gate output pulse, which has a duration of approximately 35 microseconds, is applied through CR3113, which is part of OR 6, to Q3109, the video suppression amplifier, and to Q3111, the decoding suppressor. Upon receiving the SLS gate the video suppression amplifier applies an inhibit voltage to the video amplifier and the decoding inhibitor applies an inhibitor voltage to the decoder(s). With the video amplifier and the decoder(s) inhibited, there can be no further decoding.

b. Suppression Amplifier

The suppression amplifier (Q3217) provides a 35 microsecond output gate with an amplitude of at least 20 volts. This pulse appears at the BNC receptacle on the front panel marked SUPPR. Suppression gates from external equipment can be applied to the Model 505 TRANSPONDER via the SUPPR. jack J1002. External gates pass through CR3217, which is part of OR 6, to the video suppression stage Q3109. This disables the video amplifier for the duration of the applied gate.

4-6. Gate Generator and Reply Circuits (Cont.)

c. Mode C Gate Generator

The output pulse from AND 3 is used to trigger the Mode C gate generator, which consists of Q3112 and Q3113 in a monostable multivibrator configuration. Upon being triggered, the multivibrator produces a positive dc level at the collector of Q3112, and a negative dc level at the collector of Q3113. The multivibrator remains in the unstable state for approximately 35 microseconds, at which time it returns to the stable state.

d. Mode A Gate Generator

The output pulse obtained from AND 2 is used to trigger the Mode A gate generator which consists of Q3215 and Q3216 in a monostable multivibrator configuration. Upon being triggered, the multivibrator produces a positive dc level at the collector of Q3216 which is applied to OR 2, and a negative dc level at the collector of Q3215 which is applied to AND 4. The multivibrator remains in the unstable state for approximately 35 microseconds, at which time it returns to the stable state.

e. Mode Gate Emitter Follower

OR 2 consists of diodes CR3109 and CR3110, and is utilized to produce an output gate when either the Mode C or the Mode A gate generator has been triggered. The output of OR 2 is applied to emitter follower Q3116 and thence to the circuits used for either Mode C or Mode A, namely the SLS gate generator (Q3114 and Q3115), the encode pulse amplifier (Q3110), the clock gate (Q3201), and the automatic overload control (Q3214 and Q3213).

f. Automatic Overload Control

The automatic overload control circuit (Q3213) keeps a running account of the reply rate, and reduces the sensitivity of the receiver section when the rate exceeds the predetermined limit set by potentiometer R3401. Pulses received from the Mode gate mixer are integrated by C3214 and a dc level is established at the base of transistor Q3214. Since the pulse width is fixed, the dc level is proportional to the transmitter reply train rate. Q3213 and Q3214 form a two stage dc amplifier, the output of which is used to control the gain of i-f amplifier stages Q2002 and Q2003. When the reply rate approaches the "turn down" value, the gain of the IF amplifier is reduced to discriminate against weaker singnals and to limit the number of replies. This prevents damage to the transmitter tube.

4-6. Gate Generator and Reply Circuits (Cont.)

g. Encode Pulse Amplifier

The Mode gate mixer (Q3116) output is differentiated and applied to Q3110, the encode pulse amplifier. The output of this common emitter amplifier is a pulse which is applied through the delay line driver (Q3107) to the delay line for reply train encoding.

4-7. REPLY TRAIN ENCODING

a. Mode C Encoding

A negative encoding pulse is applied to the input of the delay line (DL3401) by the delay line driver (Q3107). The pulse travels down the delay line, and as it passes F_1, the first tap, it delivers the first framing pulse to OR 5. The OR 5 input diodes are CR3303 to CR3312 inclusive. This pulse passes through OR 5, AND 4 consisting of CR3301 and CR3219 (since AND 4 is also receiving a gate from the Mode C gate generator), and OR 3, to the read pulse amplifiers (Q3211, Q3212). The OR 3 circuit consists of transistors Q3209 and Q3210 and accepts either Mode C or Mode A reply pulses. This is the first framing pulse for the reply pulse train. As the encoding pulse travels on down the delay line toward the terminating resistor (R3384) it passes taps $C_1, A_1, C_2, A_2, C_4, A_4, B_1, B_2, B_4, D_4$ and SPI, and delivers a pulse to each one as it passes. Taps $C_1, A_1, C_2, A_2, C_4, A_4, B_1, B_2, B_4, D_4$ and SPI, apply pulses through to their corresponding AND circuits (AND circuits 14 - 21, 28 and 29). The transducer circuits, C_1 through SPI, are also connected to the AND's. Pulses will appear at the output of those AND's enabled by the transducer. The transducer enables the AND's by applying grounds.

A pulse appearing at the output of any of these AND circuits is automatically a part of the reply pulse train, because the pulse passes on through OR 5, AND 4 (since AND 4 is also receiving a gate from the Mode C gate generator), and OR 3 to the read pulse amplifier.

As the encode pulse passes the delay line tap F_2 on its way to the termination, it delivers a framing pulse to OR 5. This pulse appears in the pulse train because it also passes through OR 5, AND 4, and OR 3 to the read pulse amplifier.

b. Mode A Encoding

During the encoding period AND 5 is enabled by the Mode A gate generator. The framing pulses developed during the encoding period at the F_1 and F_2 taps on the delay line are

applied through OR 4, AND 5, and OR 3 to the read pulse amplifier. The pulses developed at the A group (A_1, A_2, and A_4), B group, C group, and D group taps on the delay line are applied to the corresponding encoding AND circuits (AND circuits 7 through 12 and 22 through 27). Since twelve taps are used, there are twelve encoding AND circuits. The individual AND circuits are enabled or inhibited depending upon the four identity code numbers which have been programmed into the Regency Model 505 TRANSPONDER at the CONTROL HEAD (505 CH). The output pulses developed at the various encoding AND circuits as the encoding time passes are applied through OR 4, AND 5, and OR 3 to the read pulse amplifiers (Q3211 and Q3212).

The correct location of the information pulses in a Mode A reply pulse train can be determined by analyzing the identification code number. As is related in paragraph 4-12-d each of the four code knobs controls the encoding of one group of information pulses in the reply pulse train. If the code number programmed into the A group (A_1, A_2, and A_4) is five, then the pulses appearing in the A group will be the pulses with subscripts totaling five, hence pulses A_1 and A_4.

c. IDENT Hold

Upon depressing the IDENT button located on the control panel, the -12 volts forward bias is removed from Q3304, a pnp transistor. Q3304 is switched off producing a negative SPI gate at the collector. Q3304 does not return to its normal condition upon releasing the IDENT button because C3327 maintains the cutoff bias on the base of this transistor for a period of from 10 to 30 seconds, depending upon the setting of R3402.

d. SPI Encoding

The negative SPI gate from Q3304 is applied through emitter follower Q3303 to AND 13, consisting of resistors R3337, R3338 and R3339. The SPI pulse from the IDENT tap on the delay line can pass through AND 13 as long as the SPI gate exists. The pulse from AND 13 is passed through OR 4 to AND 5. If the reply is Mode A, the pulse passes through AND 5 and on through OR 3 to the read pulse amplifier. Since the output of AND 13 is not applied to OR 5, the SPI pulse cannot appear in a Mode C reply.

e. Read Pulse Amplifier

The pulse train from OR 3 is amplified by the read pulse amplifier (Q3211 and Q3212)

4-7. Reply Train Encoding (Cont.)

and applied to AND 6 which includes diodes CR3203 and CR3204 for ANDing the selected delay line pulses with the timing clock output pulses.

4-8. PULSE TRAIN SHAPING AND TIMING

a. Clock Gate

Transistor Q3201, the clock gate, amplifies and inverts the mode gate signal from the mode gate mixer emitter follower for application to the timing clock.

b. Clock

The clock is a temperature compensated LC oscillator that operates at 689.655 kc. Transistor Q3202 is the oscillator transistor. During a reply, the negative dc level from the clock gate back biases CR3201. This removes the clamp signal from the base of Q3202. The energy stored in L3201 causes oscillations to start instantly. When the reply has been completed, a positive dc level from the clock gate passes through CR3201 (now forward biased) to the base of the oscillator, clamping the oscillator in the full-off condition. The positive dc level is held on the base of the oscillator until another reply is initiated.

c. Clock Pulse Amplifier

The clock pulse amplifier is Q3203 and Q3204. The output of the oscillator is passed through Q3203, an emitter follower, and through a half-wave rectifier CR3202. Transistor Q3204 amplifies only the negative half of the output signal. The input signal is of amplitude sufficient to cause heavy clipping of the amplified pulses. In this manner, the stage converts the 689.655 kc half sine waves into a pulse train having 1.45 - microsecond pulse spacings.

d. AND 6

AND 6 consisting of diodes CR3203 and CR3204 is a coincidence circuit which is used to integrate the accurate timing qualities of the clock pulses into the reply pulse train. One input to AND 6 is from the clock pulse amplifier Q3204, and the other is from the read pulse amplifier Q3212. The timing of the reply train pulses as they leave AND 6 is solely determined by the clock pulses. This is because the clock pulses are considerably more narrow than the pulses derived from the delay line and there must be coincidence between the two for AND 6 to produce output.

4-8. Pulse Train Shaping and Timing (Cont.)

e. Reply Pulse Amplifier

The reply pulse train from AND 6 is amplified and shaped in the reply pulse amplifier. The amplifier consists of an emitter follower Q3205, common emitter amplifier Q3206, and two emitter followers (Q3207, Q3208) which drive the modulator at a low impedance level.

4-9. MODULATOR

The amplified reply pulse train from emitter follower Q3208 is applied to the modulator stage Q4001 through potentiometer R4004. CR4001 clamps the input to the modulator transistor to prevent the signals from going positive. L4001 differentiates the pulses into the modulator to improve the rise time of the pulses out of the modulator. Both R4004 and L4001 are adjustable to control amplitude and shape of pulses applied to the modulator.

4-10. POWER SUPPLY

The power supply is a regulated dc to dc converter. Transistors Q5003 and Q5004 switch the primary of the power transformer, T5001, at approximately 1500 cps. Silicon diodes are used as full-wave rectifiers in the secondary circuits of the transformer to supply the various dc voltages to the transistor circuits and to the receiver local oscillator. RC networks are utilized to provide filtering and isolation. A conventional series regulator circuit consisting of transistors Q5001, Q5002, Q5102, and Q5103 is utilized to provide regulation of the supply with zener diode CR5105 and CR5106 employed as the reference diode. The regulation afforded makes the output voltages relatively insensitive to variations in the dc input voltage. Short circuit protection is provided by the inherent characteristics of the converter and the choice of components. AC heater power for the vacuum tubes in the transmitter and receiver local oscillator is supplied by a separate secondary winding of the power transformer, T5001. The high voltage for the transmitter oscillator is developed with the voltage doubler rectifier circuit consisting of diodes CR5201 through CR5206 and capacitor C5001. The primary power relay (RY5001) is controlled by the function switch in the CONTROL HEAD (505 CH).

The hash filter consists of C5004 and L5001. The filter attenuates the RF interference inherent in aircraft power lines, and prevents the interference generated in the Model

505 TRANSPONDER from disturbing other equipment connected to the same primary power supply.

4-11. CONTROL HEAD (505 CH)

The Regency Model 505 TRANSPONDER CONTROL HEAD (505 CH) provides control of:

a. DC primary power to the RECEIVER-TRANSMITTER (505 RT).

b. Transmitter disabling

c. Mode selection

d. Mode A Encoding

e. IDENT feature

f. Receiver Sensitivity

g. FUNCTION TESTER (505 FT) On/Off

h. Test (system)

i. Visual monitor of reply

Explaining these functions in order:

a. The dc primary power to the RECEIVER-TRANSMITTER (505 RT) is off with the function switch (S6009) at OFF, and on with the switch set at either SBY, ON or LO SENS. Due to the relatively high current in the primary power circuit, a relay (RY5001), located in the RECEIVER-TRANSMITTER (505 RT) power supply, is utilized to provide the actual switching action. The function switch controls the relay.

b. The transmitter disabling is also controlled by the function switch. The RECEIVER-TRANSMITTER (505 RT) is disabled when the function switch is in the SBY (standby) position. When in this position, the switch grounds the video processor inhibit line. (See Q3109, in figure 27).

c. Mode selection is accomplished by simply placing the mode switch (S6008) at the desired mode(s). In the A or C position this switch causes the C or A inhibit line to be grounded, respectively. In the AC position, neither inhibit line is grounded.

d. Mode A Encoding is controlled by the 4 beacon code switches in the CONTROL HEAD (505 CH) (S6004, S6005, S6006, S6007). Each switch controls the encoding of a complete pulse group (three pulses of the same denomination). The units switch (S6004) controls the D pulses (D1, D2, and D4), while the tens, hundreds, and thousands switches (S6005, S6006, S6007) control the C, B, and A pulses, respectively.

4-11. CONTROL HEAD (505 CH) (Cont.)

These lines are connected through the main interconnection cable to the twelve encoding AND circuits in the RECEIVER-TRANSMITTER (505 RT).

e. The SPI pulse is enabled with the IDENT push button switch (S6001) depressed. When depressed, the switch applied +12 volts to the SPI gate enable line. This line is connected through the interconnection cable to the SPI gate circuit in the TRANSMITTER-RECEIVER (505 RT) (see Q3304 in figure 27).

f. The LO SENS position reduces the receiver sensitivity by 12 db and should be operated on request from A.T.C..

g. The Test On/Off switch (S6002) controls the primary power to the FUNCTION TESTER (505 FT).

h. The test switch (S6003) activates the interrogation portion of the FUNCTION TESTER (505 FT).

i. The RPLY light indicates that the RECEIVER-TRANSMITTER (505 RT) is replying either to ground interrogations or to the simulated signal from the FUNCTION TESTER (505 FT).

4-12. FUNCTION TESTER (505 FT)

The Regency Model 505 TRANSPONDER FUNCTION TESTER (505 FT) provides the pilot with an in-flight visual monitor of the Regency Model 505 TRANSPONDER system performance and a means of ground checking the unit prior to take off.

The unit operates by sampling a small portion of the transmitted RF pulse through DC-1. The RF pulse is detected by CR-1 and applied to a monostable multivibrator consisting of Q1, Q2 and associated components. The time constant of the multivibrator is adjusted to provide an approximate 1/3 sec on time. The output of the multivibrator is applied to the lamp driver. The lamp driver (Q3) drives the RPLY light (DS6001) in the CONTROL HEAD (505 CH).

High frequency noise is injected into the antenna line of the system when the test switch is depressed. Buzzer M-1 is the source of this signal. The signal is injected through DC-1. The injected high frequency noise simulates, statistically, an interrogation signal and the RECEIVER-TRANSMITTER (505 RT) will then reply with an encoded pulse train.

SECTION 5

ALIGNMENT AND TESTING

5-1. GENERAL

This section contains instructions for alignment and testing of the Model 505 TRANSPONDER.

5-2. TEST EQUIPMENT

The following test equipment (or equivalent) is necessary to align and test the Model 505 TRANSPONDER.

Note: The equipment listed is merely an example of the type of equipment required. Other equipment may be used. The individual service shop may contact the Regency factory for assistance in maintainence or selection of test equipment.

1. Two Double pulse generators: Beckman/Berkeley, Model 4904
2. Oscilloscope: Tektronix, Model 545 with:
   a. Dual trace plug-in unit: Type CA
   b. Wide band preamp plug-in unit: Type B
3. Two UHF Signal Generators: Hewlett-Packard, Model 612A.
4. Coaxial directional coupler: Hewlett-Packard, Model 766D.
5. Crystal detector: American Electronics Lab, Model C-1100.
6. Microwave power meter: Hewlett-Packard, Model 430C, with:
   a. Thermistor mount: Model 477B
7. Spectrum analyzer: Polarad, Model TSA-W, with:
   a. Display Unit, Model DU
   b. L-Band head, Model STU-2A
8. Sweep Generator: Telonic Industries, Model SM-2000 with:
   a. Plug-in Head, Model S-6
9. Frequency counter: Hewlett-Packard, Model 523B
10. Pulse timer: Teletronics, Model PT-244
11. Standing wave indicator: Hewlett-Packard, Model 415B
12. L-Band coaxial slotted line: Hewlett-Packard, Model 805C
13. L-Band attenuators: Narda Corp:
   a. 20db, Model 757-20 (2 required)

5-2. Test Equipment (Cont.)

b. 30db, Turret, Model 705

c. 6db, Model 756-6

14. 91 ohm termination

15. VOM: Simpson 260

SAFETY FIRST

WARNING

Exercise extreme caution while making all adjustments within the Model 505 TRANSPONDER. Personal contact with the high voltages could cause serious injury or death.

5-3. PRESELECTOR ALIGNMENT

Note: It is highly unlikely that the preselector will require retuning during the life of the equipment.

a. Connect slotted line standing wave indicator, and signal generator to the Model 505 TRANSPONDER as indicated in figure 31. Set signal generator to 1030 mc (modulated with 1000 cps at -3 dbm).

b. Detune Z1001-1, Z1001-2, and Z1001-3 by turning alignment screws out ten or twelve turns.

c. Slide carriage of slotted line until a minimum is obtained on the standing wave indicator. Do not change this adjustment during the rest of the preselector alignment.

d. Tune Z1001-1 by turning alignment screw in, for maximum indication on standing wave indicator.

e. Tune Z1001-2 for minimum indication on standing wave indicator.

f. Tune Z1001-3 for maximum indication on standing wave indictor. The previous steps may produce a preselector bandpass with large ripples. For fine bandpass adjustment, proceed to the following steps: The test setup is shown in figure 32. Set sweep generator for maximum output (0db).

g. Tune Z1001-1, Z1001-2, and Z1001-3 for a flat bandpass response centered at 1030 mc. A bandpass should be obtained with minimum ripple and tilt between the 1026 mc and 1034 mc markers.

5-3. Preselector Alignment (Cont.)

h. Tighten the locknuts of Z1001-1, Z1001-2, and Z1001-3.

5-4. LOCAL OSCILLATOR ALIGNMENT

a. Adjust the tuning screw of Z1001-4 until it protrudes 1/2 inch from the case (refer to figure 33).

b. Adjust the tuning screw of Z1001-5 until it protrudes 1/2 inch from the case.

c. Connect dc voltmeter across R1101 (as in figure 33). Turn the Model 505 TRANSPONDER on. (Allow at least 2 minutes for warm-up.)

d. Adjust Z1001-4 and Z1001-5 for minimum voltage indication (approximately 1.5 volts).

e. Place RF probe of spectrum analyzer near V1001 and check frequency against the calibrated 1090 mc marker.

f. If frequency is incorrect, make the following adjustments.

1. Turn Z1001-4 in to decrease frequency or out to increase frequency.

2. Turn Z1001-5 for minimum voltage indication across R1101.

g. Repeat steps 1 and 2 until correct frequency is obtained with a minimum voltage indication across R1101.

5-5. IF AMPLIFIER ALIGNMENT

a. Remove the cover from the IF strip and solder a short piece of insulated wire to R2027 (1500 ohms) as indicated in figure 34. Bring the wire out through the hole in the upper right hand corner of the top cover. Replace the cover and fasten it with mounting screws.

CAUTION

Do not ground or short this test lead when power is turned on as this may result in damage to Q2006.

b. Connect sweep generator and oscilloscope as shown in figure 34.

c. Set attenuator pad on sweep generator to 50 db.

d. Place the Model 505 TRANSPONDER in standby operation and adjust the oscilloscope and sweep generator frequencies to display the IF response curve.

5-5. IF Amplifier Alignment (Cont.)

e. Adjust the sensitivity potentiometer (R2002) for approximately +1/2 volt at the sensitivity test point on the back of the i-f strip (see figure 24).

f. Adjust the AOC potentiometer (R3401) for +8 volts at the AOC test point (see figure 24).

g. Tune each IF coil, starting withL2004 and proceeding, in turn, thru L2014. Each transformer should be adjusted to obtain a flat passband with symmetrical skirts centered on the 1030 mc marker. The bandpass response should not be more than 3 db down at 1027 and 1033 mc. It may be necessary to repeat this procedure several times to obtain the required bandpass at maximum gain.

h. If the maximum response obtained from the above procedure meets all requirements with the exception of being slightly off center from 1030 mc, follow the procedure below:

1. Adjust tuning screw Z1001-4 on local oscillator until IF response is centered at 1030 mc.

2. Repeat alignment procedure of step g.

j. If a uniform response cannot be obtained, refer to paragraph 5-3 and realign the preselector.

k. Upon completion of alignment, remove wire from R2027 and replace I.F. cover.

5-6. RECEIVER SENSITIVITY

a. Connect Model 505 TRANSPONDER to the test equipment as shown in figure 35.

b. Be sure the modulator potentiometer (R4004) is fully counterclockwise.

c. Connect the output of the RF generator to the L-band detector and adjust the output of the double pulse generator to provide interrogation pulses as shown in figure 3.

d. Connect the RF generator to the ANTENNA jack on the Model 505 TRANSPONDER.

e. Place the CONTROL HEAD (505 CH) in SBY operation and allow two minutes warmup time.

5-6. Receiver Sensitivity (Cont.)

f. Set frequency of RF generator to 1030 mc, and set output to -72 dbm with an interrogation rate of 200 per second.

g. Set control switch to ON and adjust R2002 for 180 replies per second.

h. Set output of signal generator to -60 dbm and adjust R2001 for 180 replies per second.

5-7. SIDE LOBE SUPPRESSION

a. Connect the Model 505 TRANSPONDER to the test equipment as shown in figure 36.

b. Connect the output of RF generator #1 to the L-band detector and adjust the output of the double pulse generator for two 0.8 microsecond pulses as shown in figure 3 and an interrogation rate of 200 prf.

c. Connect the output of RF generator #2 to the L-band detector and adjust the generator for a single pulse which is 0.8 microsecond wide.

d. Set the frequencies of both RF generators to 1030 mc.

e. Reconnect the RF generators to the directional coupler. Set the output of generator #1 to -25 dbm and the output of generator #2 to -90 dbm. Observe the output at the solder terminal on extreme right at the bottom of Board 3100. This signal should consist of two negative pulses with the leading edges spaced 21 microsecond apart.

f. Set the output of RF generator #2 to provide -25 dbm at the transponder antenna jack. Vary the pulse delay of generator #2 until the leading edge of the pulse from this generator occurs 2.0 microseconds after the first pulse from generator #1.

g. Set the output of generator #2 to -30 dbm and adjust potentiometer R3102 for 180 replies per second.

h. To assure the SLS circuits are working properly over the range of signal levels, make the checks listed in table on the next page:

5-7. Side Lobe Suppression (Cont.)

FROM GENERATOR #1	FROM GENERATOR #2	REPLIES PER SECOND
-70dbm	-70dbm	0
-70dbm	-79dbm	200
-50dbm	-50dbm	0
-50dbm	-59dbm	200
-30dbm	-30dbm	0
-30dbm	-39dbm	200

SLS RESPONSE CHECK

i. If any of the conditions in table 2 cannot be met, readjust potentiometer R3102 and repeat step h.

5-8. MODULATOR AND TRANSMITTER ALIGNMENT

a. Connect Model 505 TRANSPONDER to the test equipment as shown in figure 37.

b. Turn R4004 fully counterclockwise (modulator driver off).

c. Turn R4002 fully clockwise (maximum bias for transmitter oscillator).

d. Place CONTROL HEAD (505 CH) in normal operation and apply Mode A interrogations at a rate of 500 pulses per second.

e. Set the beacon code switches at code 0000.

f. With a VOM, measure the negative dc voltage between ground and the end of L4002 nearest the edge of the modulator bracket.

g. Adjust R4002 such that the meter reads -80 volts.

h. Turn R4004 clockwise until the reply framing pulses are observed on the oscilloscope. The pulses should be approximately 0.45 microsecond wide.

i. Observe frequency on spectrum analyzer.

j. Adjust the cavity tuning control on the transmitter to center the transmitted frequency on a calibrated marker at 1090 mc.

k. Turn R4004 (modulator drive potentiometer) clockwise to increase, or counterclockwise to decrease, the detected RF pulse width. L4001 is a fine adjustment for pulse width. Adjust these controls to get detected RF pulses with the following characteristics.

5-8. Modulator and Transmitter Alignment (Cont.)

Pulse width:	0.45 ± 0.1 microsecond (at 50% amplitude)
Maximum rise time:	0.10 microsecond
Maximum decay time:	0.20 microsecond

l. Set the beacon code switches at code 7777.

m. Check the pulse widths for uniformity. (Maximum deviation ± 0.10 microsecond.)

n. Repeat steps k and l, if necessary, to improve pulse uniformity.

o. Tighten lock-nuts on R4002, and L4001.

p. Measure the Model 505 TRANSPONDER power output, which should be at least 500 watts ± 3 db peak.

5-9. REPLY TRAIN AND SPI PULSE SPACING

a. Connect Model 505 TRANSPONDER to the test equipment as shown in figure 37.

b. Turn on and interrogate at 500 interrogations per second with 8 microsecond spaced pulse pairs.

c. Set the beacon code selector switches on the CONTROL HEAD (505 CH) to code 7777.

d. Adjust the oscilloscope and observe the transmitted reply pulse train.

e. Adjust L3201 for 20.3 microsecond spacing between the framing pulses (see figure 3).

f. Press the IDENT button switch on the CONTROL HEAD (505 CH) and observe the occurrence of the SPI pulse 4.35 microseconds (± 0.1 microsecond) after the last framing pulse. The oscilloscope should display the waveform illustrated in figure 3.

g. Adjust R3402 until the SPI pulse remains on approximately 15 seconds after the IDENT switch is released.

5-10. AUTOMATIC OVERLOAD CONTROL

a. Operate the Model 505 TRANSPONDER as described in paragraph 5-6, with the following exceptions:

1. Interrogate at 1500 prf.

5-10. Automatic Overload Control (Cont.)

2. Set input signal level for -44 dbm.

b. Connect frequency counter to the SUPPRESSION output jack.

c. Adjust R3401 for a rate of 1350 replies per second.

Note: This concludes the service adjustments section in this handbook. Special instructions and training are necessary for further maintainence. Please contact the Regency factory for information.

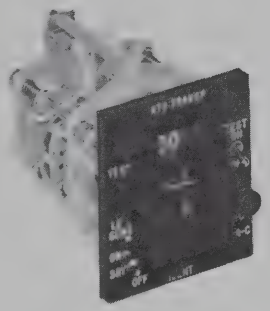
SECTION 6

ILLUSTRATIONS

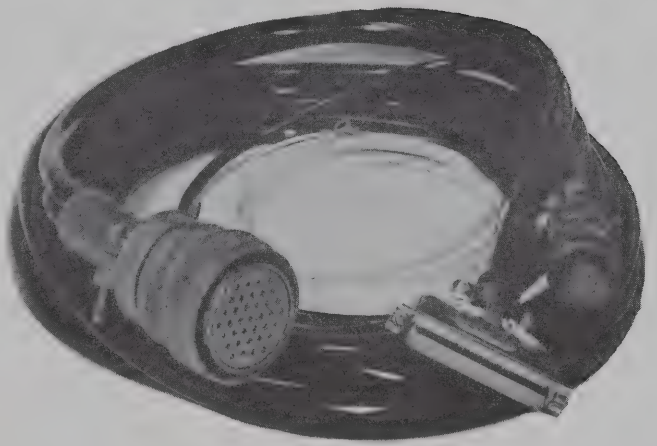
RECEIVER-TRANSMITTER
(505RT)

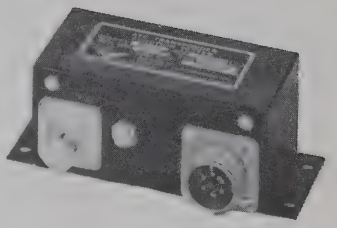
ANTENNA
(505 A)

CABLE ASSEMBLY
(505 CA)



CONTROL HEAD
(505 CH)





FUNCTION TESTER
(505 FT)

Figure 1. The Regency MODEL 505 TRANSPONDER

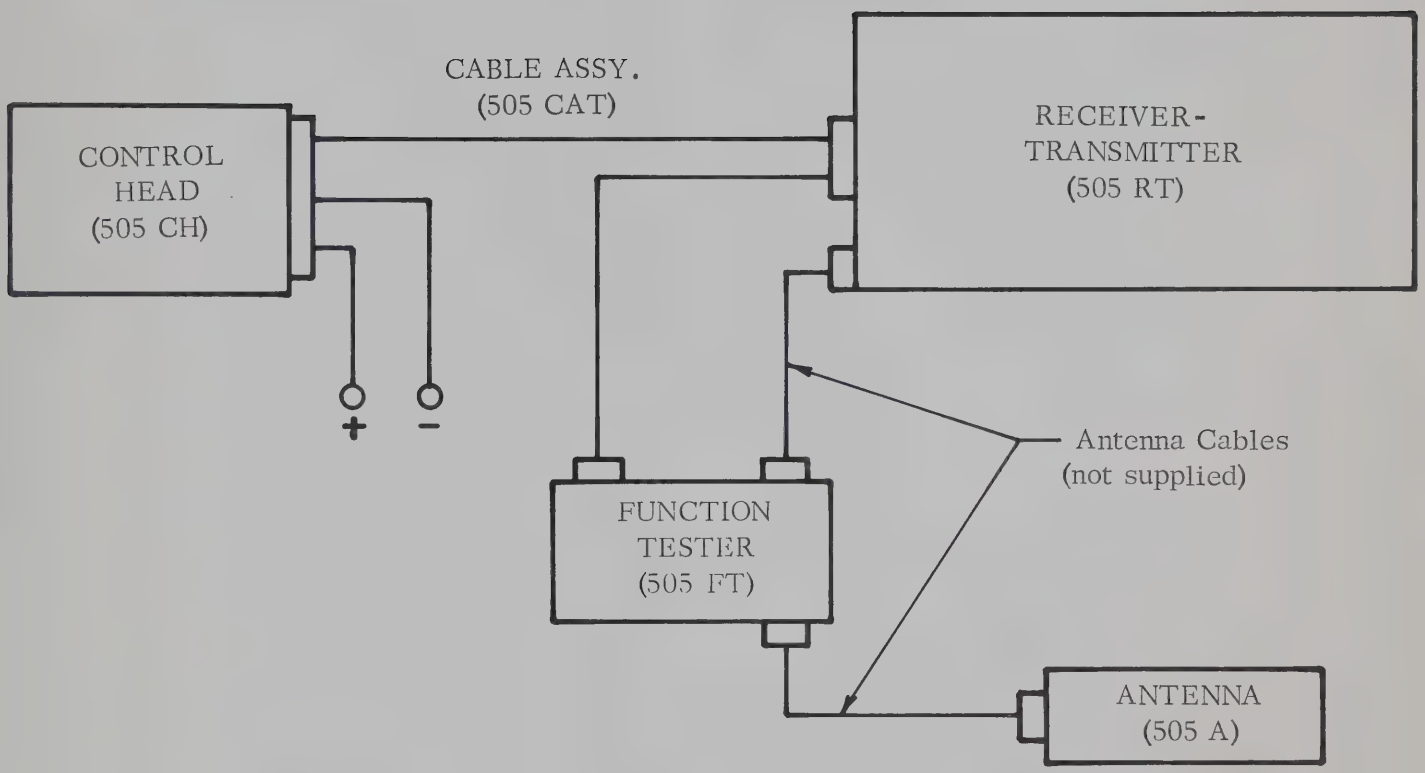
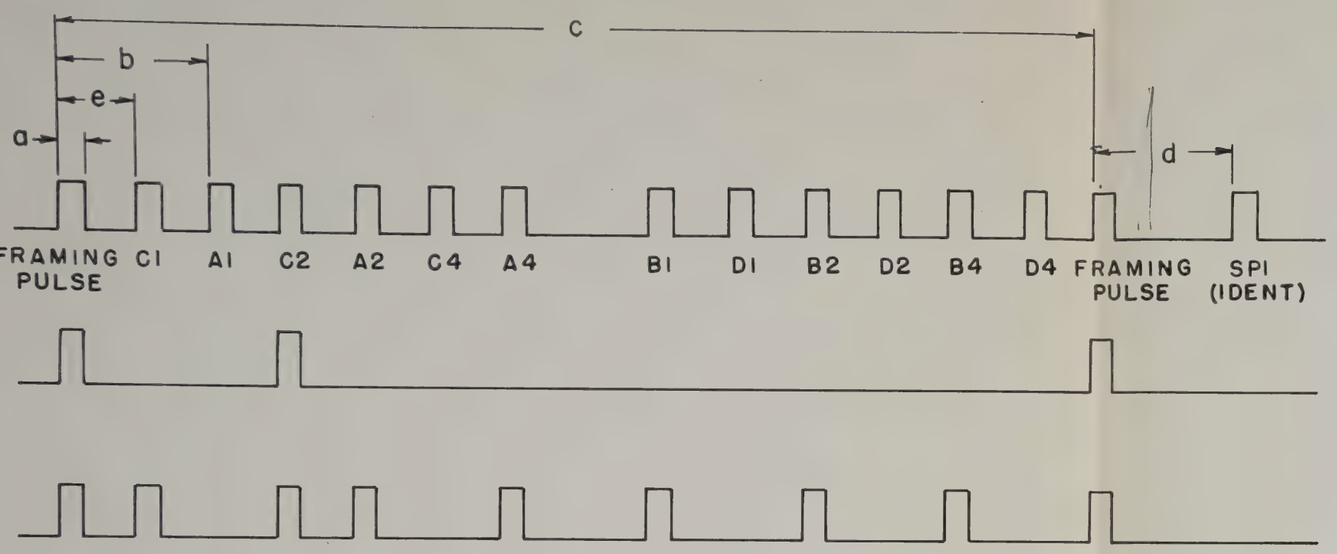
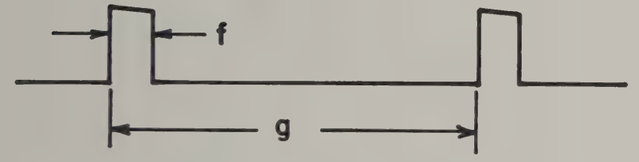


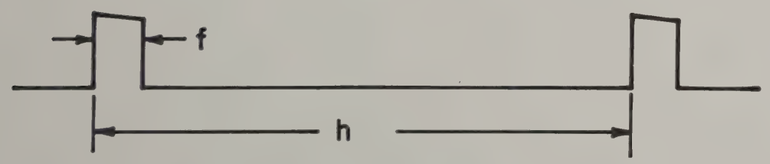
Figure 2. MODEL 505 TRANSPONDER
Cabling Diagram

PROPER PULSE REPLY TRAIN

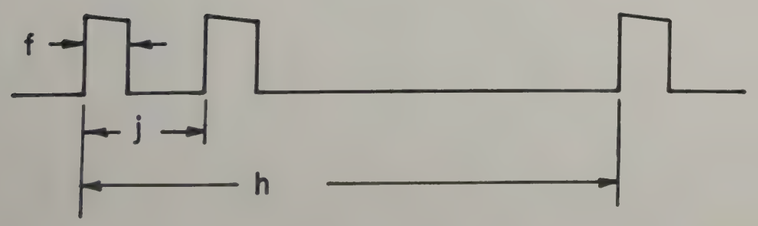




MODE 3/A INTERROGATION



MODE C INTERROGATION



MODE C INTERROGATION
WITH SIDE LOBE SUPPRESSION

PROPER INTERROGATION PULSES

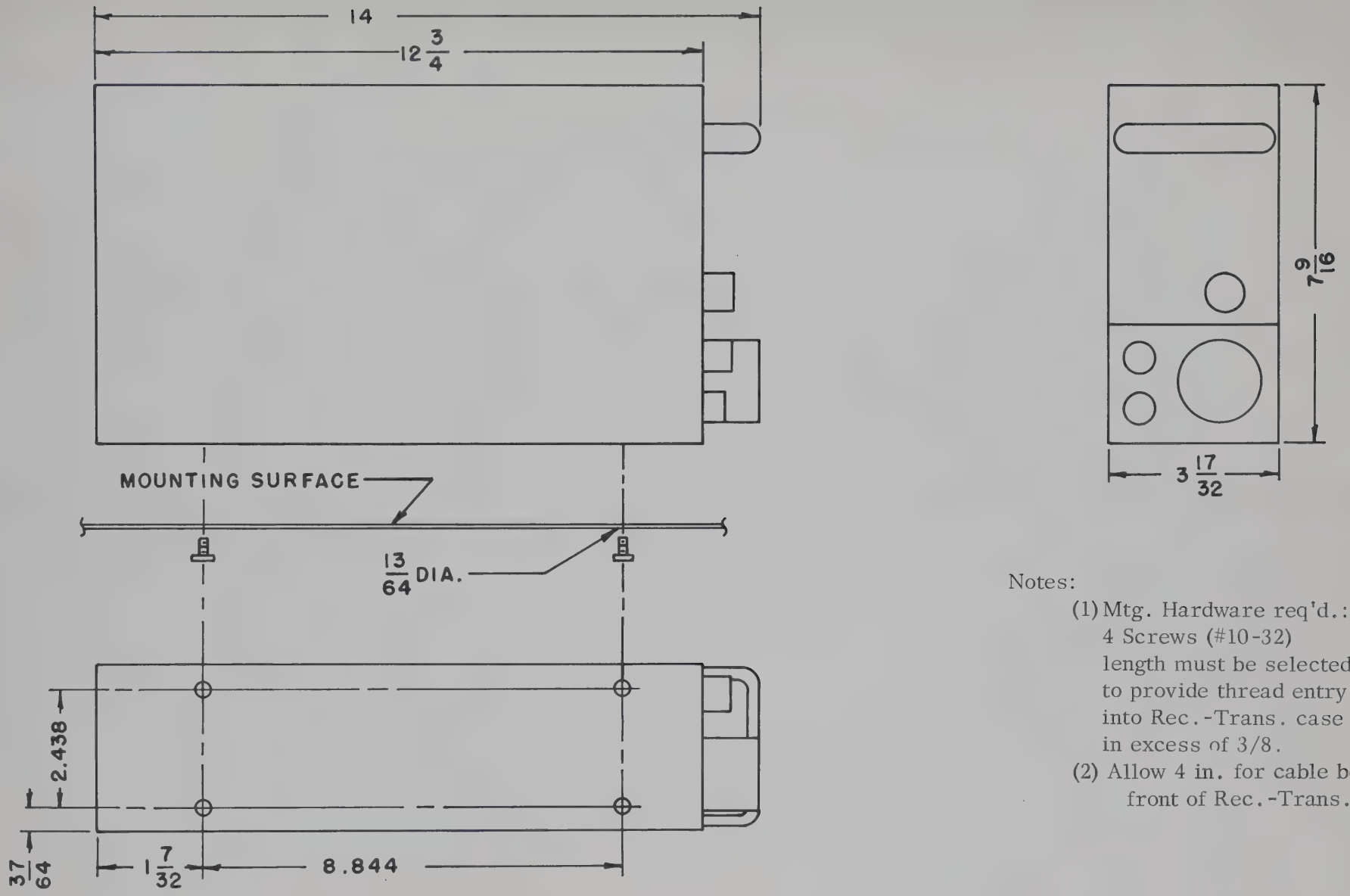
CONDITIONS:

INTERROGATION MODE	CODE SELECTOR SETTING	ALTITUDE ABOVE SEA LEVEL	IDENT BUTTON DEPRESSED
A	7777	ANY	YES
C	ANY	-1000	YES OR NO
C	ANY	9,400	YES OR NO

NOTE:
THE PULSES SHOULD BE OF EQUAL MAGNITUDE AND DURATION

LEGEND:
a = 0.45 μsec.
b = 2.9 μsec.
c = 20.3 μsec.
d = 4.35 μsec.
e = 1.45 μsec.
f = 0.8 μsec.
g = 8.0 μsec.
h = 21.0 μsec.
j = 2.0 μsec.

Figure 3 Reply and Interrogation Pulses Diagram

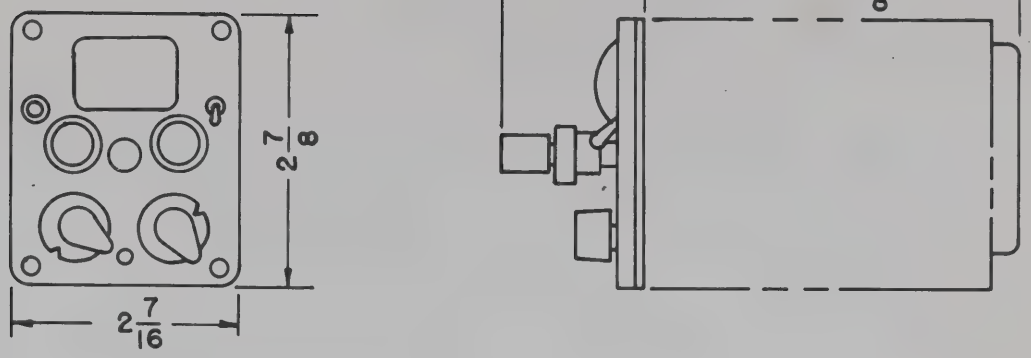


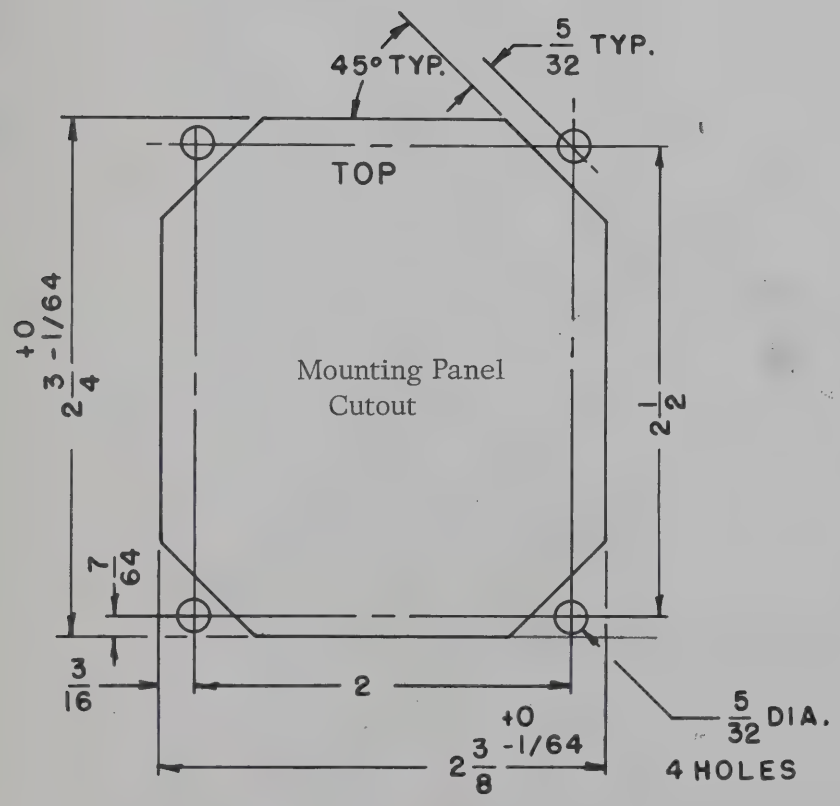
Notes:

(1) Mtg. Hardware req'd.: 4 Screws (#10-32) length must be selected to provide thread entry into Rec.-Trans. case not in excess of 3/8.

(2) Allow 4 in. for cable bend at front of Rec.-Trans.

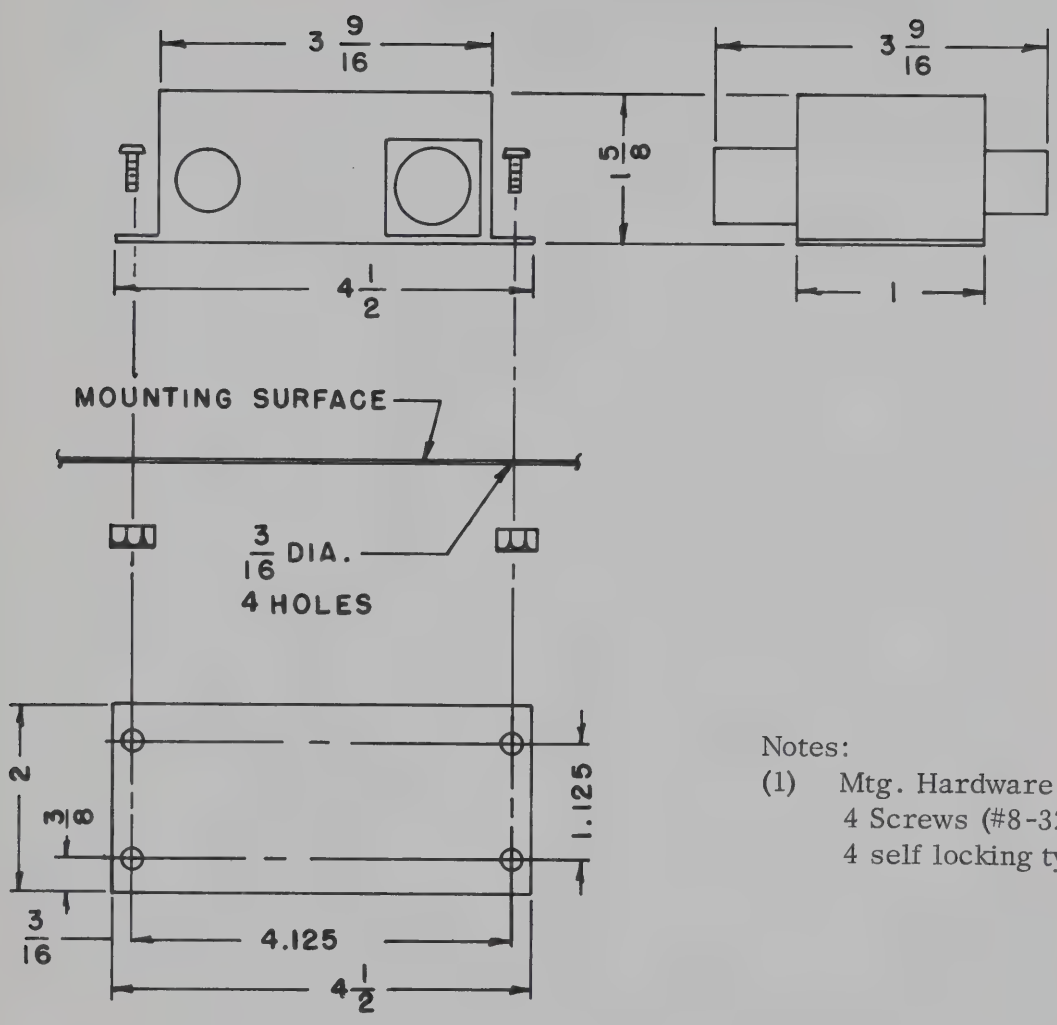
Figure 4. RECEIVER-TRANSMITTER (505 RT) Outline Dimensions and Mounting Information





Notes:
(1) Mtg. Hardware req'd:
4 Screws (#6-32)
4 Self locking type nuts
(2) Mtg. hole - see Mtg. panel cutout diagram

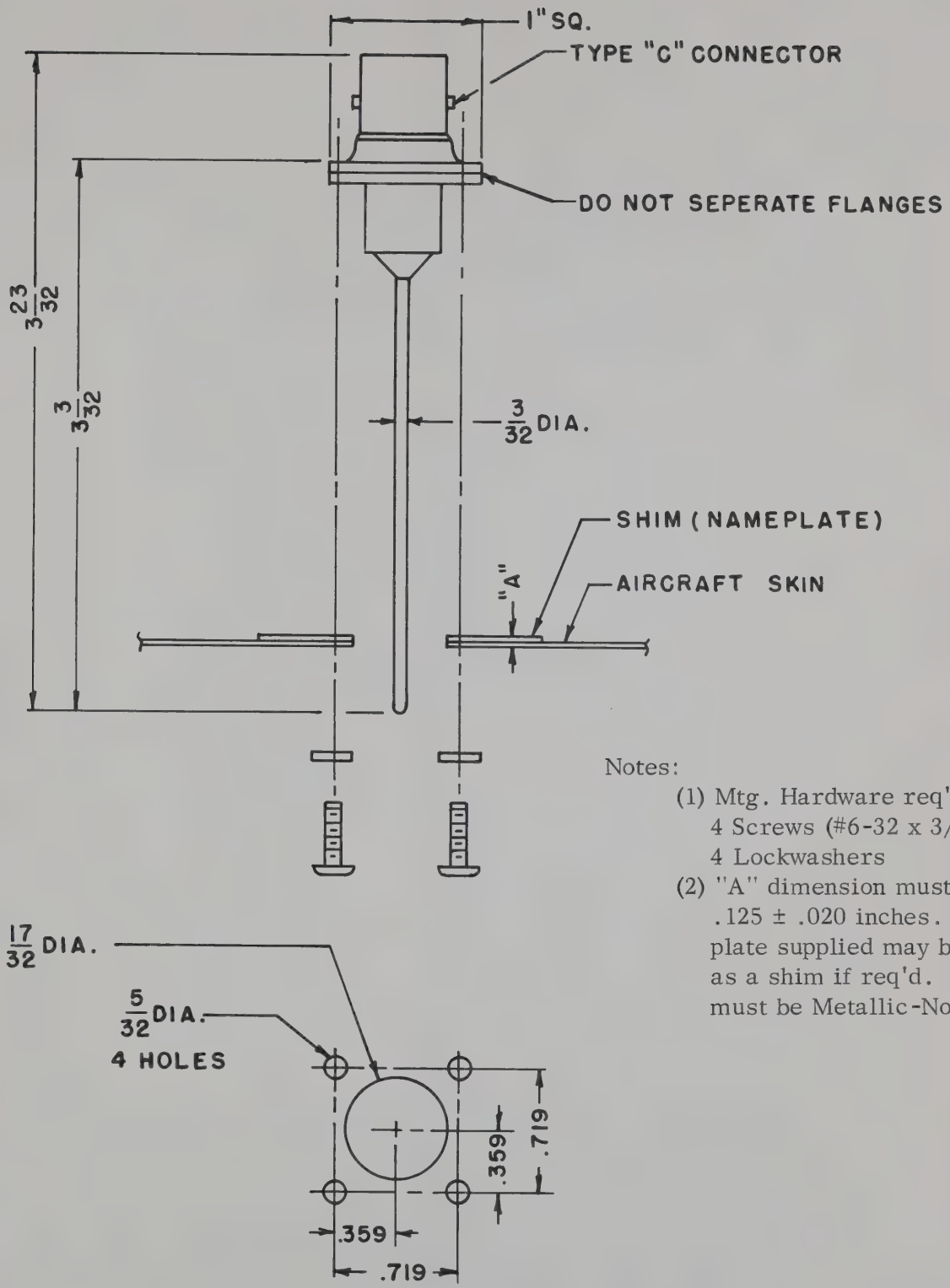
Figure 5. CONTROL HEAD (505 CH)
Outline Dimensions and
Mounting Information



Notes:

(1) Mtg. Hardware req'd.
4 Screws (#8-32) length as req'd.
4 self locking type nuts

Figure 6. FUNCTION TESTER (505 FT)
Outline Dimensions and Mounting Information



Notes:

(1) Mtg. Hardware req'd:
4 Screws (#6-32 x 3/8)
4 Lockwashers

(2) "A" dimension must be .125 ± .020 inches. Nameplate supplied may be used as a shim if req'd. (Shim must be Metallic-Not insulator)

Figure 7. ANTENNA (505 A)
Outline Dimensions
and Mounting Information

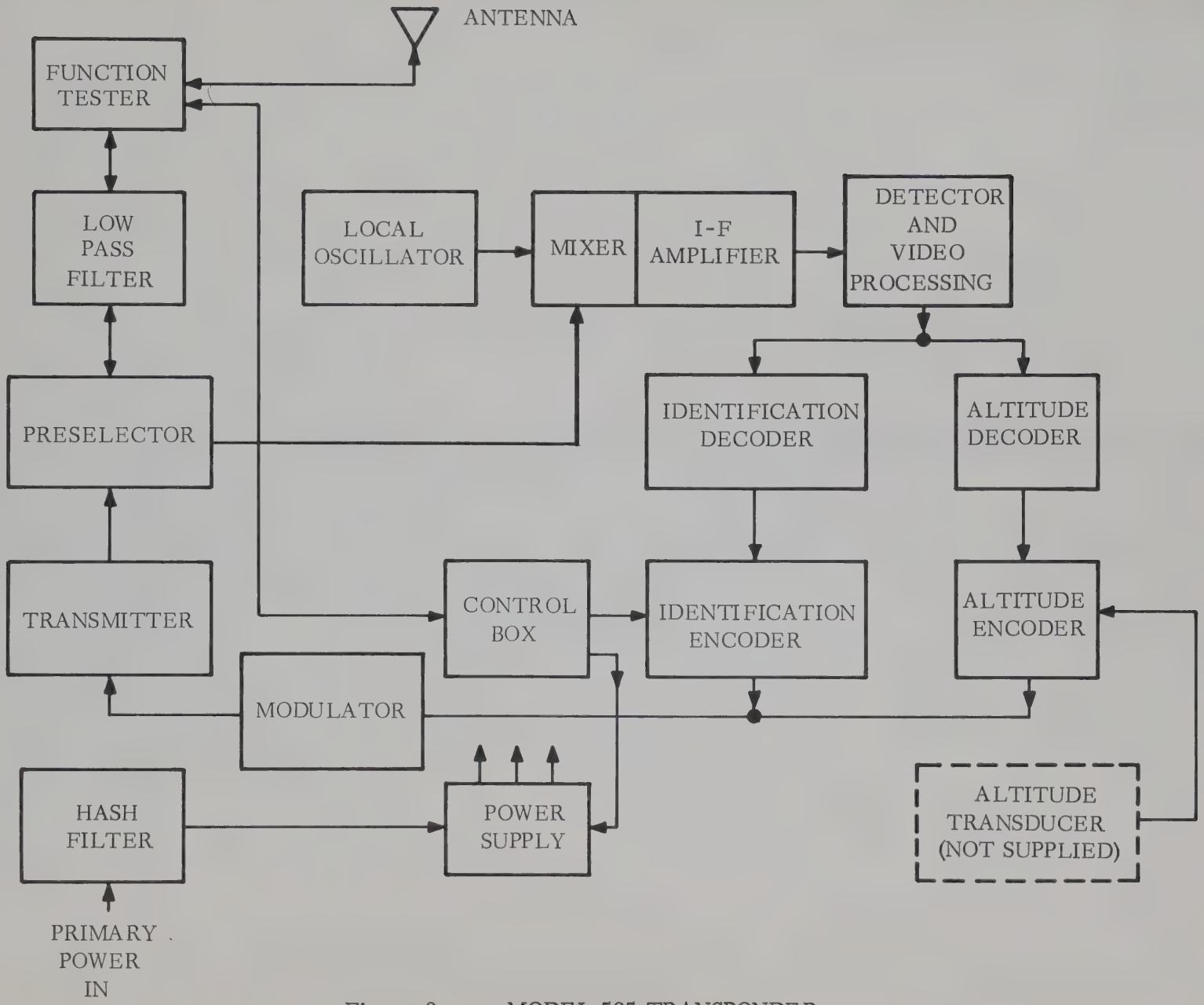


Figure 8. MODEL 505 TRANSPONDER
Simplified Block Diagram

ANTENNA J1001
HARMONIC SUPPRESSION FILTER Z1002
1030 MC
1090 MC
1030 MC
1090 MC
1090 MC
1030 MC
FUNCTION TESTER (505 FT)
TRANSMITTER V4001
1090MC
PRESELECTOR Z1001
1030MC
MIXER CR2001
60 MC
IF AMPLIFIER Q2001 THRU Q2005
DETECTOR EMITTER FOLLOWER CR2002, Q2006
SPIKE SUPPRESSOR Q3301, Q3302
ECHO SUPPRESSOR Q3101
VIDEO AMPLIFIER Q3104, Q3105 Q3106
DELAY LINE DRIVER Q3107, Q3108
TIME DELAY Q3102, Q3103
LOCAL OSCILLATOR V1101
1090 MC CW
AUTOMATIC OVERLOAD CONTROL Q3213, Q3214
ENCODE PULSE AMPLIFIER Q3110
MODULATOR Q4001
CLOCK (689.655 KC) Q3202
CLOCK GATE Q3201
MODE GATE EMITTER FOLLOWER Q3116
OR 2
MODE C GATE GENERATOR Q3112, Q3113
MODE A GATE GENERATOR Q3315, Q3316
MODE C AND 3
MODE A AND 2
VIDEO SUPPRESSION Q3109
STANDBY
OR 6
SLS GATE GENERATOR Q3114, Q3115
DECODING INHIBITER Q3111
CLOCK PULSE AMPLIFIER Q3203, Q3204
REPLY PULSE AMP. Q3205, Q3206 Q3207, Q3208
OR 7
AND 6
AND 4
AND 5
SUPPRESSOR J1002
SUPPRESSION AMPLIFIER Q3217
READ PULSE AMPLIFIER Q3211, Q3212
OR 3 Q3209, Q3210
OR 1
SLS AND 1
510 OHM TERMINATION
21μ SEC.
8μ SEC.
DELAY LINE
2μ SEC.
0μ SEC.
SP1 F2 D4 B4 D2 B2 D1 B1 A4 C4 A2 C2 A1 C1 F1
AND 23
AND 24
AND 27
AND 25
AND 26
AND 28
AND 29
AND 19
AND 20
AND 21
AND 13
HASH FILTER C5004 L5001
AIRCRAFT POWER SUPPLY
REGULATOR Q5001, Q5002 Q5101, Q5102 Q5103
POWER SUPPLY Q5003, Q5004
OR 4
AND 22
AND 7
AND 8
AND 9
AND 10
AND 11
AND 12
AND 14
AND 15
AND 16
AND 17
AND 18
OR 5
BEACON CODE SELECTOR SWITCH
CONTROL HEAD (505 CH)
ALTITUDE TRANSDUCER
IDENT GATE EMITTER FOLLOWER Q3303
IDENT HOLD Q3304
IDENT SWITCH
TEST SW
TEST ON
RPLY LIGHT
CONTROL SWITCH

RF OR IF
POSITIVE-GOING PULSE
NEGITIVE-GOING PULSE
NEGITIVE-DC LEVEL
POSITIVE-DC LEVEL
(D) DIFFERENTIATOR

Figure 9. MODEL 505 TRANSPONDER
Detailed Block Diagram

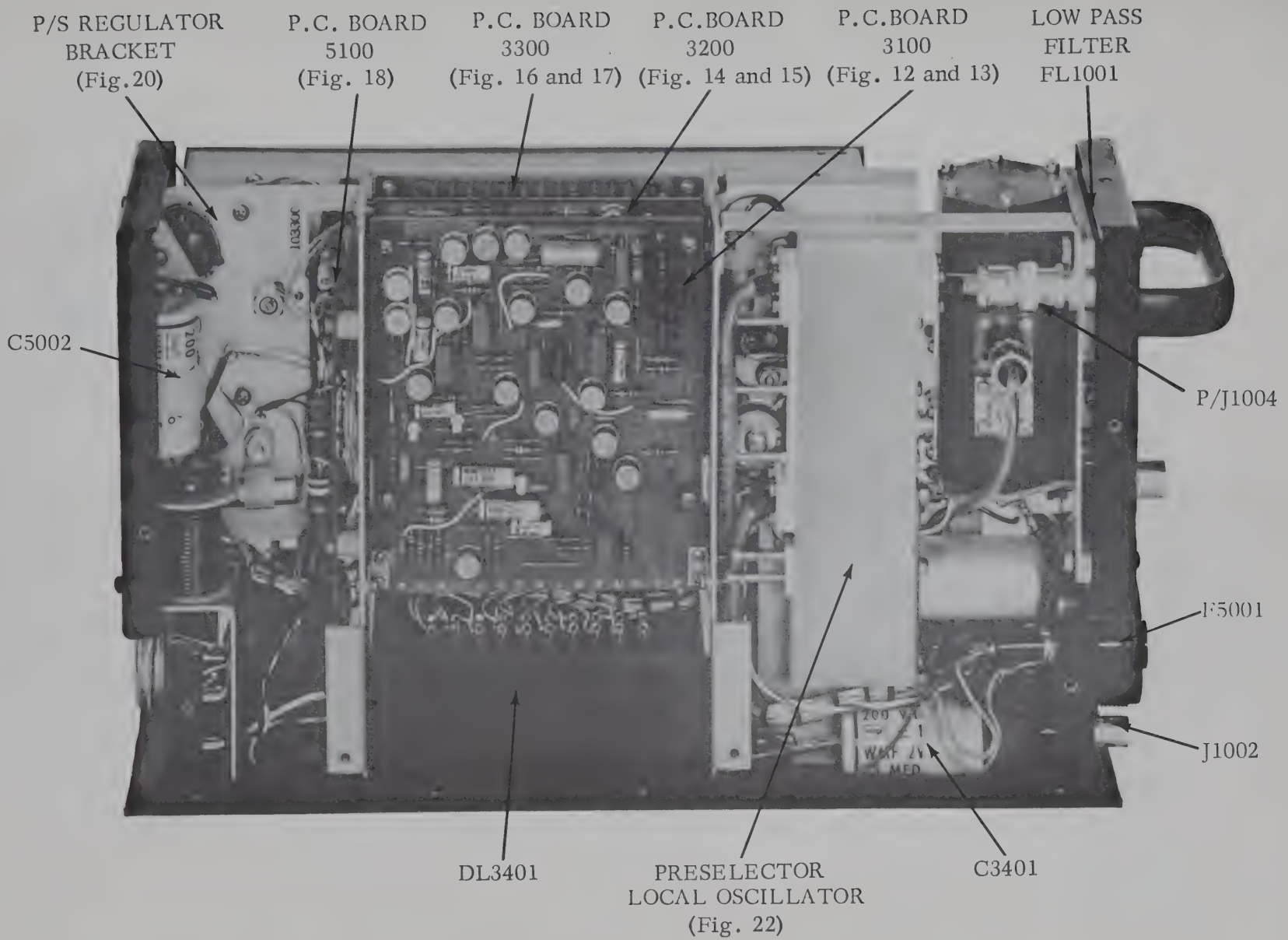


Figure 10. RECEIVER-TRANSMITTER (505 RT)
Left side view, cover removed.

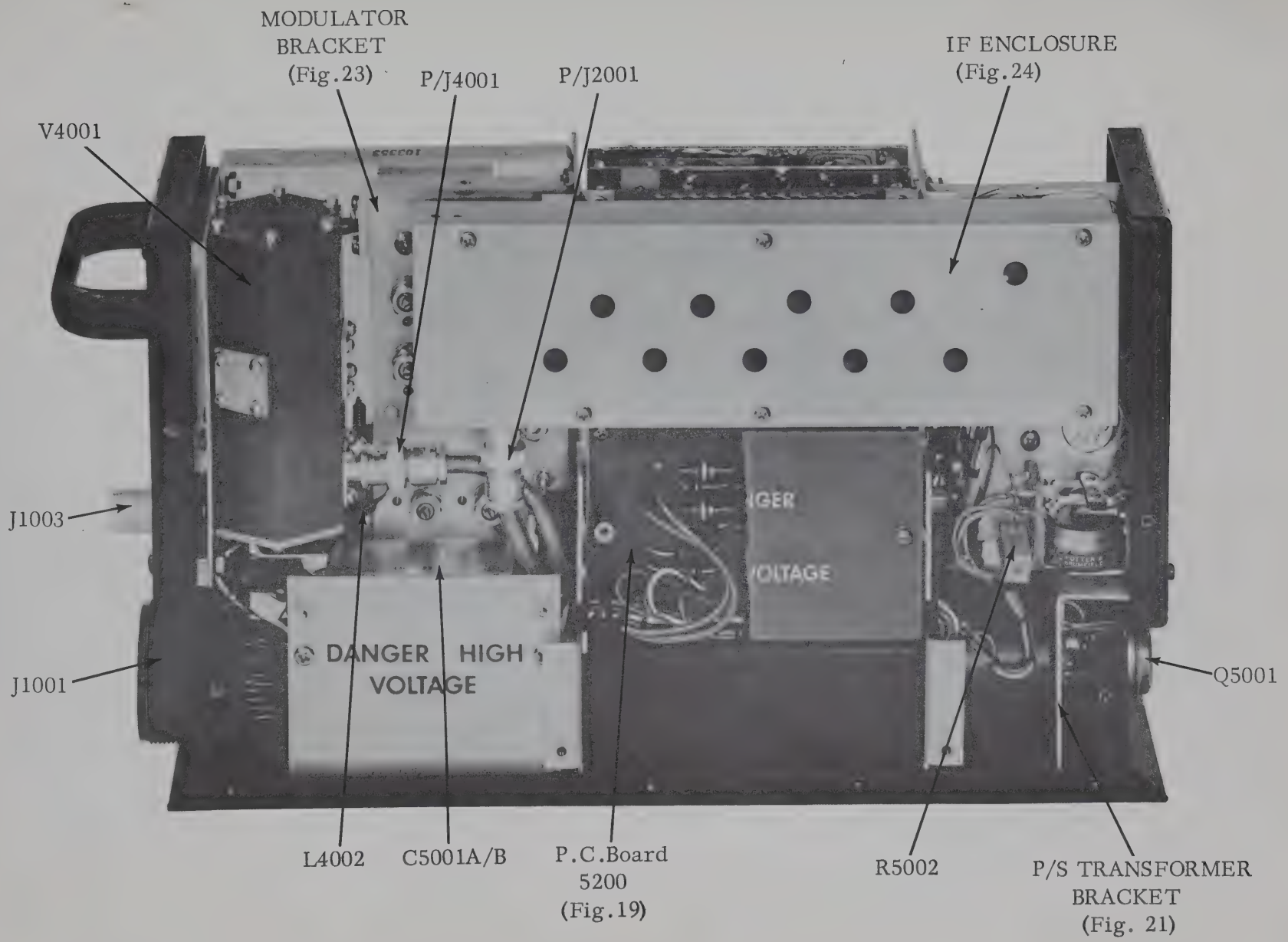


Figure 11. RECEIVER-TRANSMITTER (505 RT)
Right side view, cover removed.

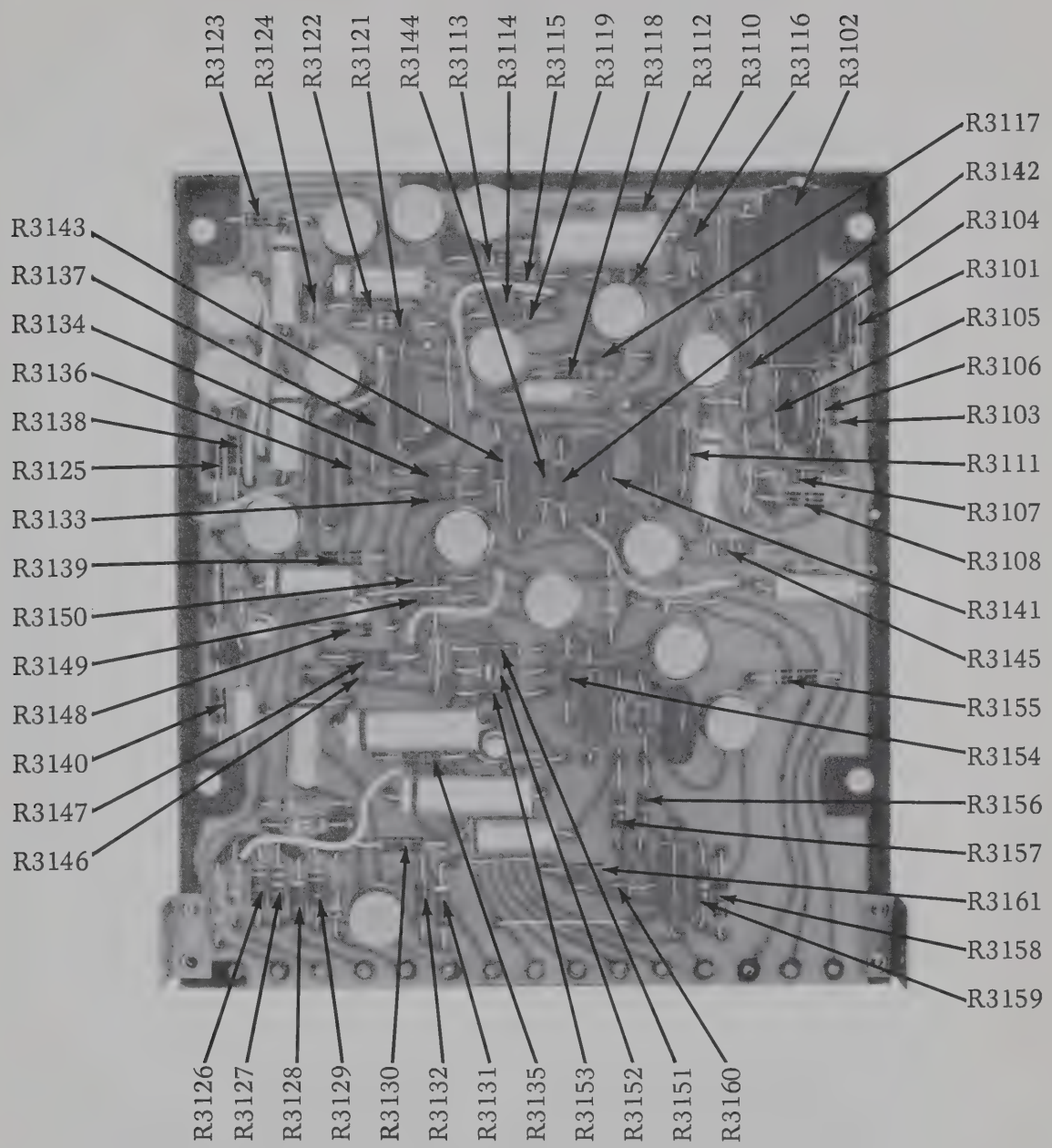


Figure 12. Printed Circuit Board 3100
(Sheet 1 of 2)

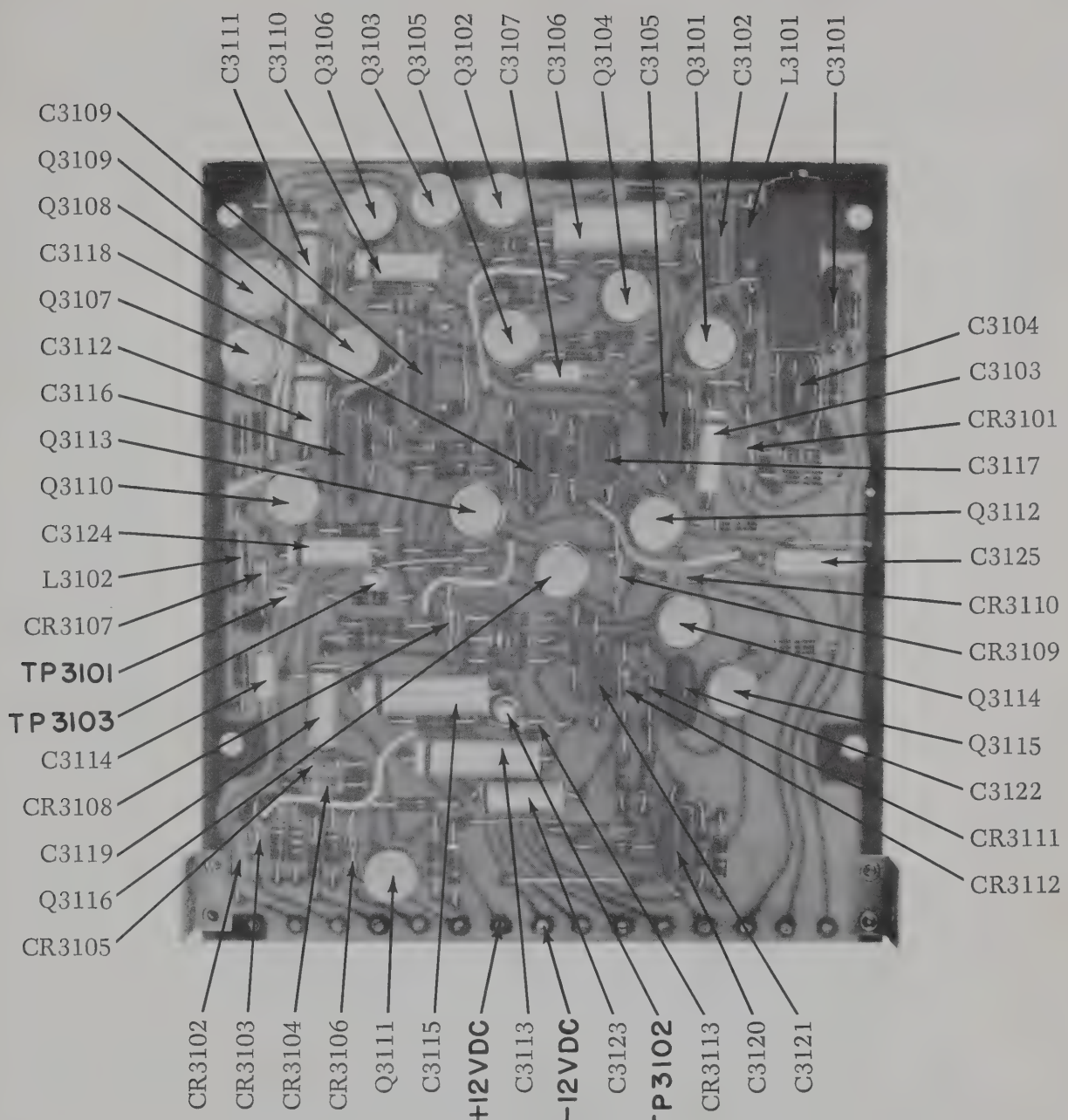


Figure 13. Printed Circuit Board 3100
(Sheet 2 of 2)

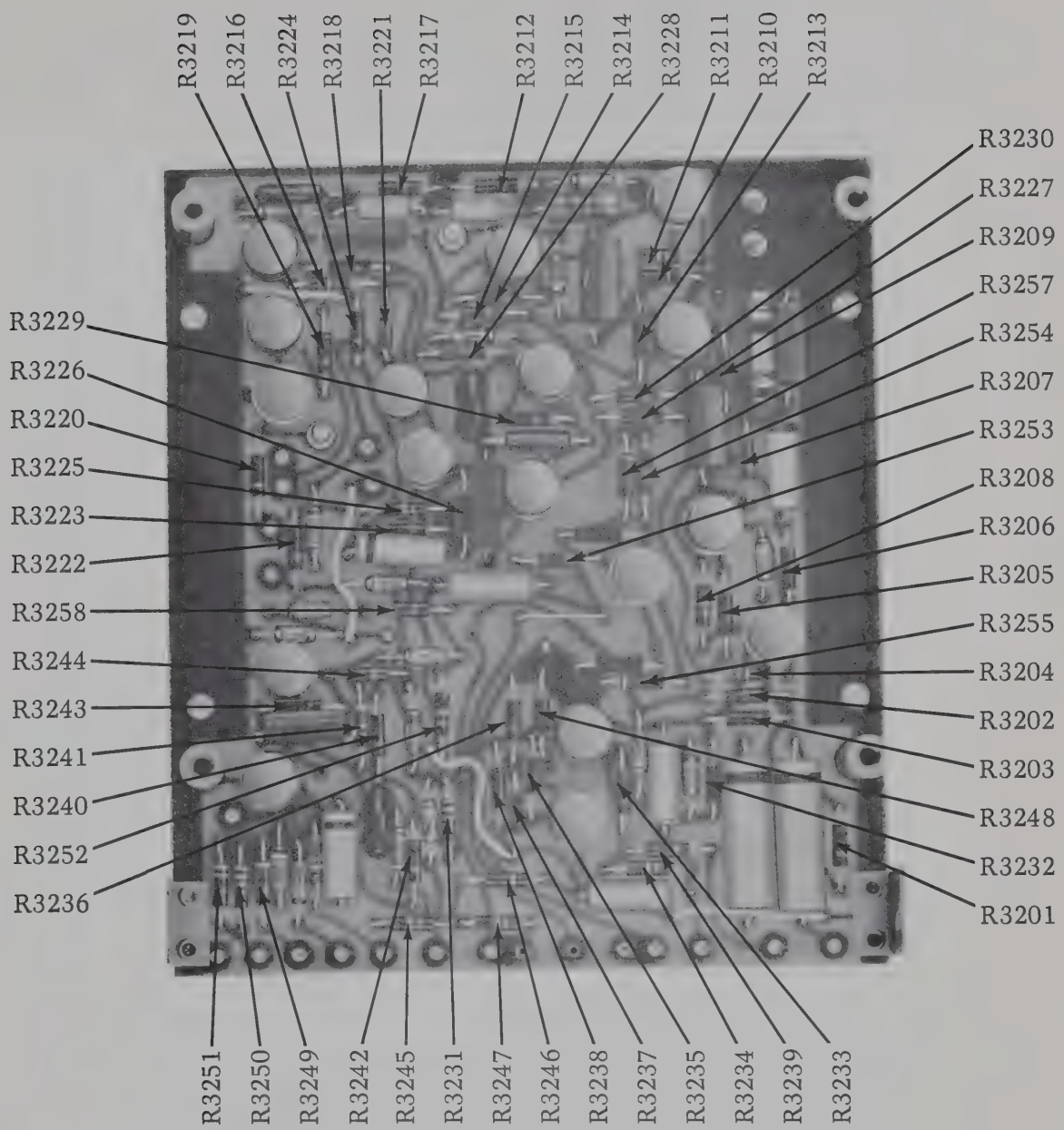


Figure 14. Printed Circuit Board 3200
(Sheet 1 of 2)

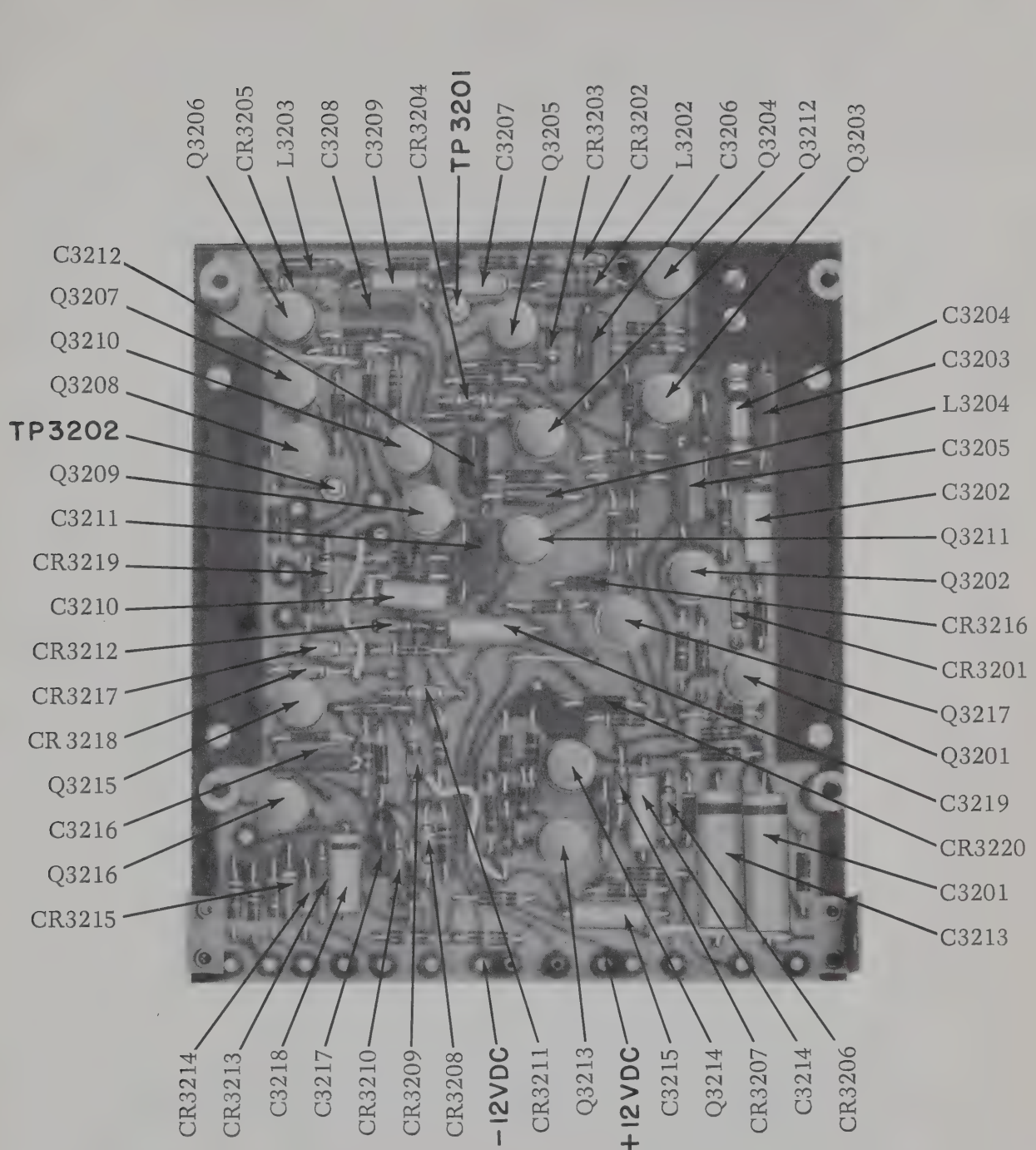


Figure 15. Printed Circuit Board 3200
(Sheet 2 of 2)

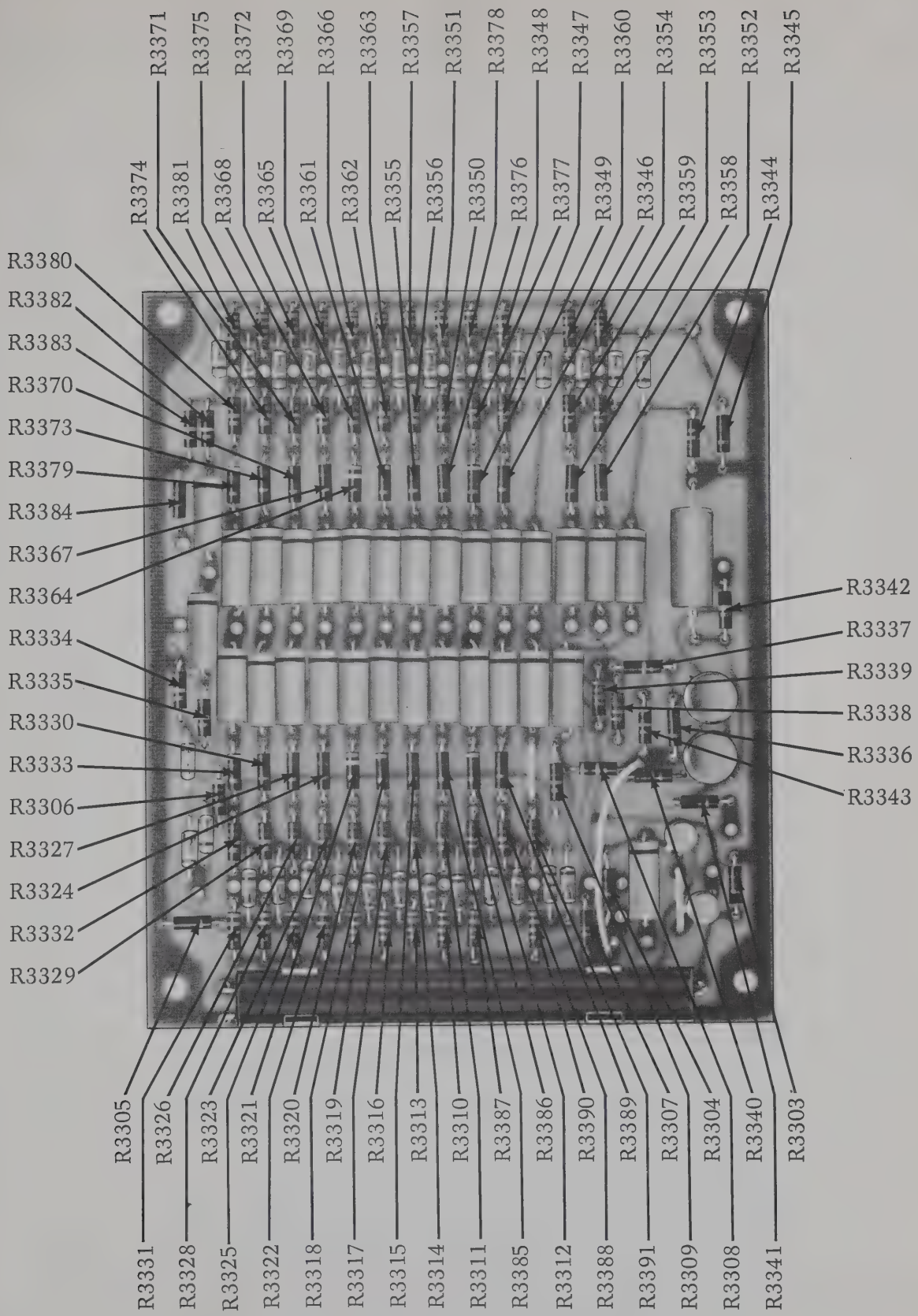


Figure 16. Printed Circuit Board 3300
(Sheet 1 of 2)

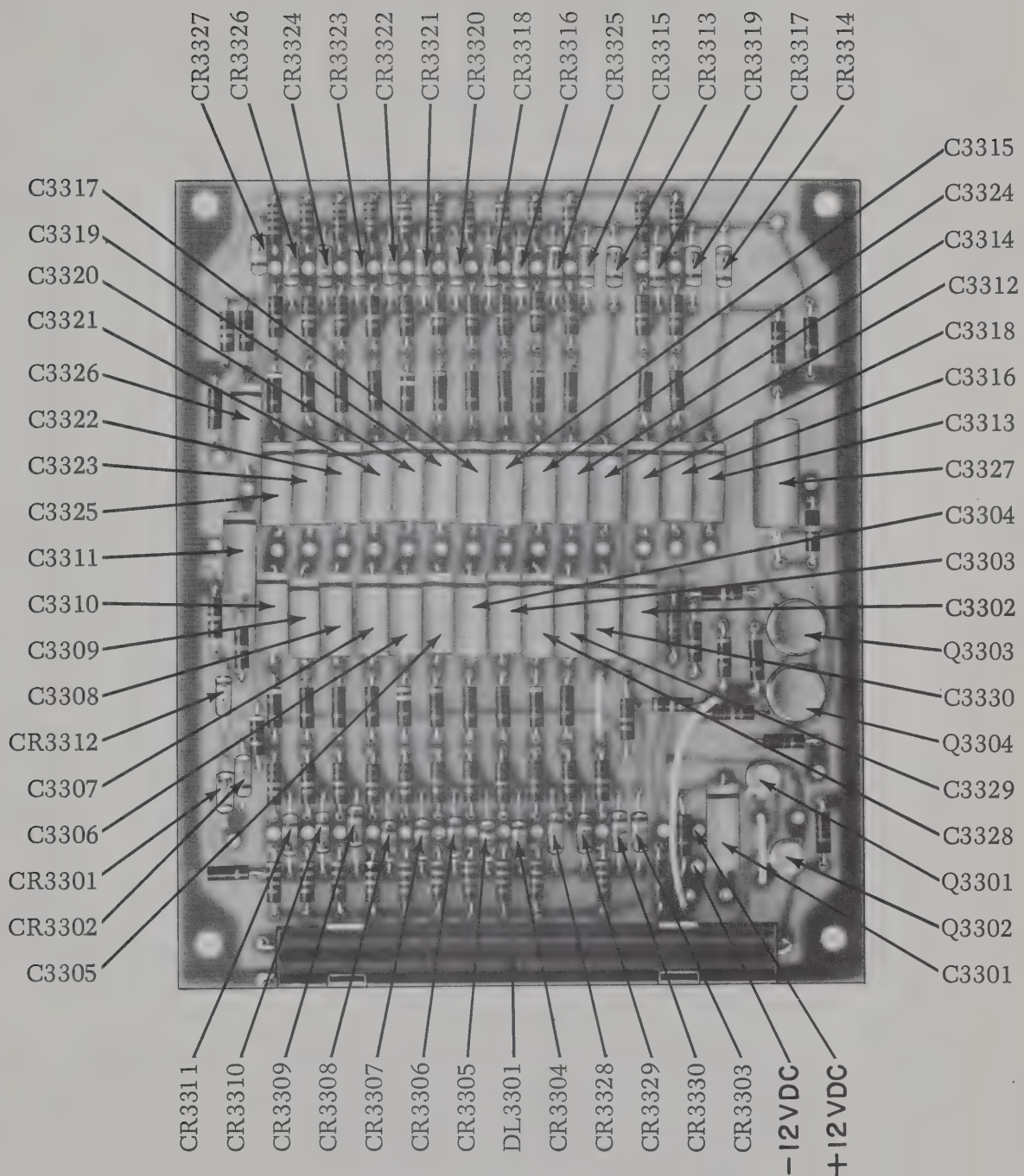


Figure 17. Printed Circuit Board 3300
(Sheet 2 of 2)

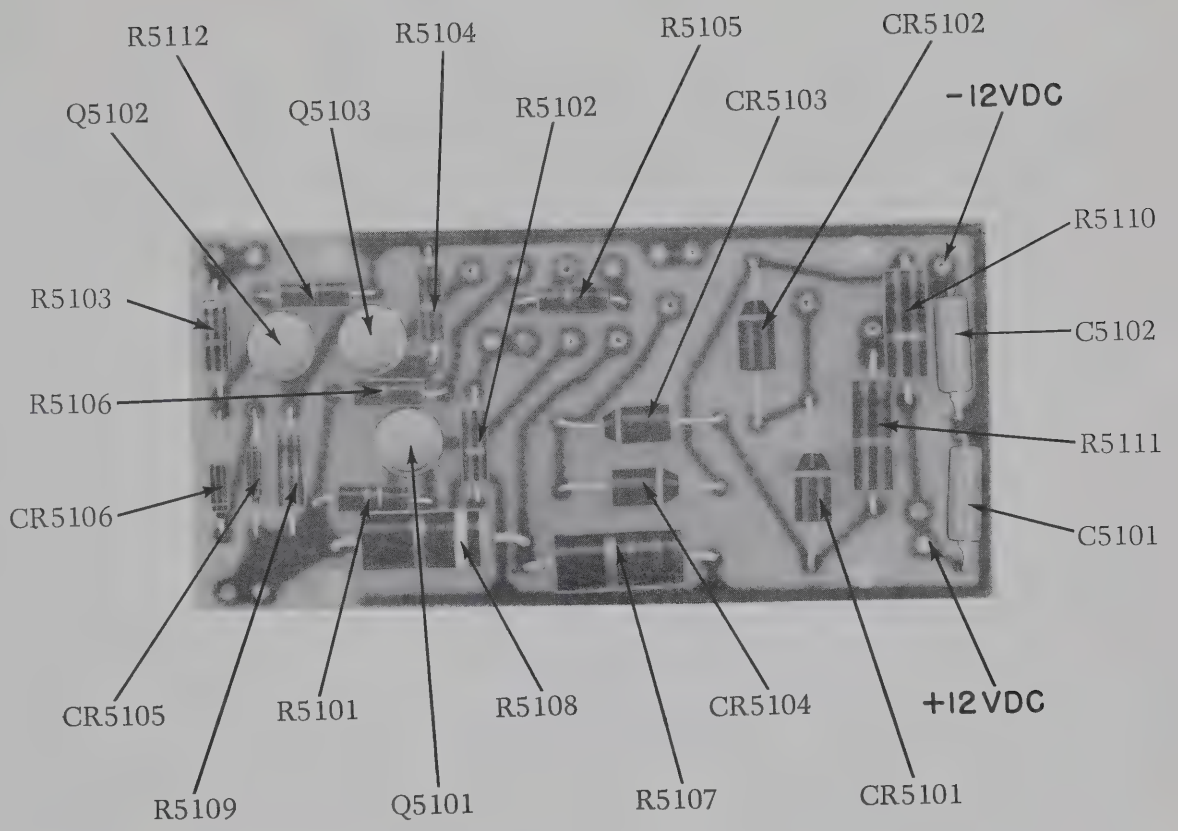


Figure 18. Printed Circuit Board 5100

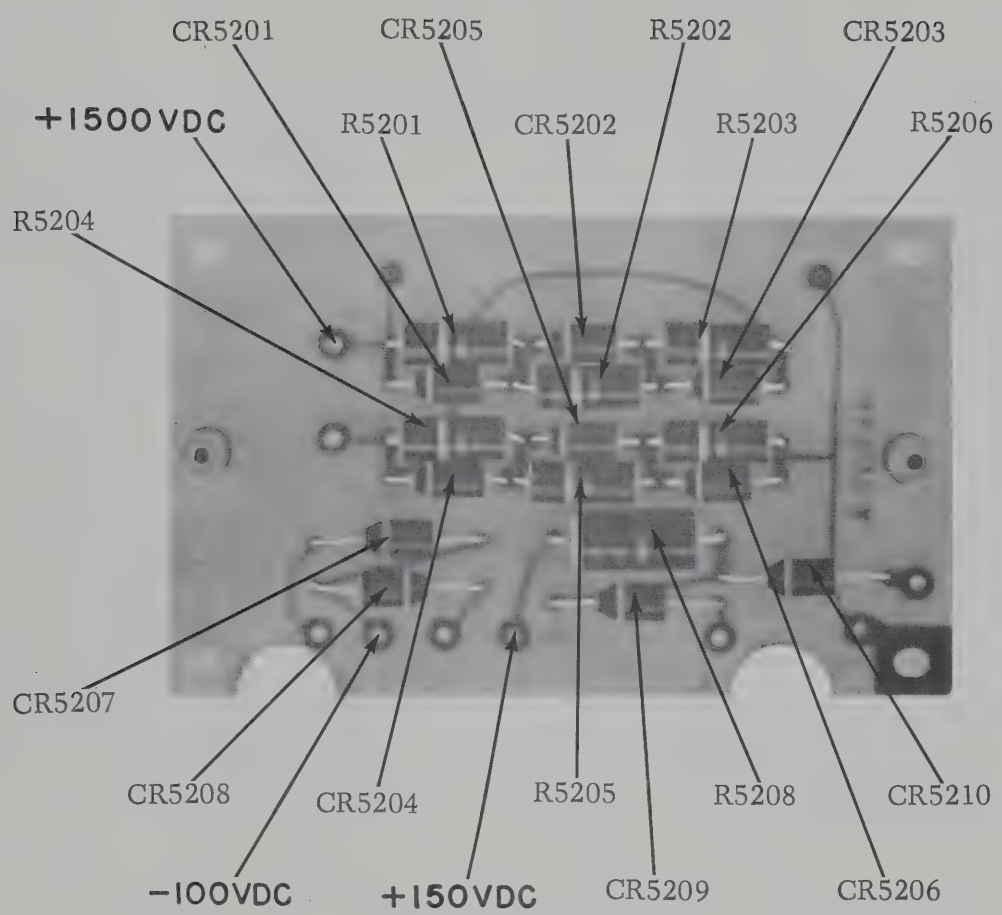


Figure 19. Printed Circuit Board 5200

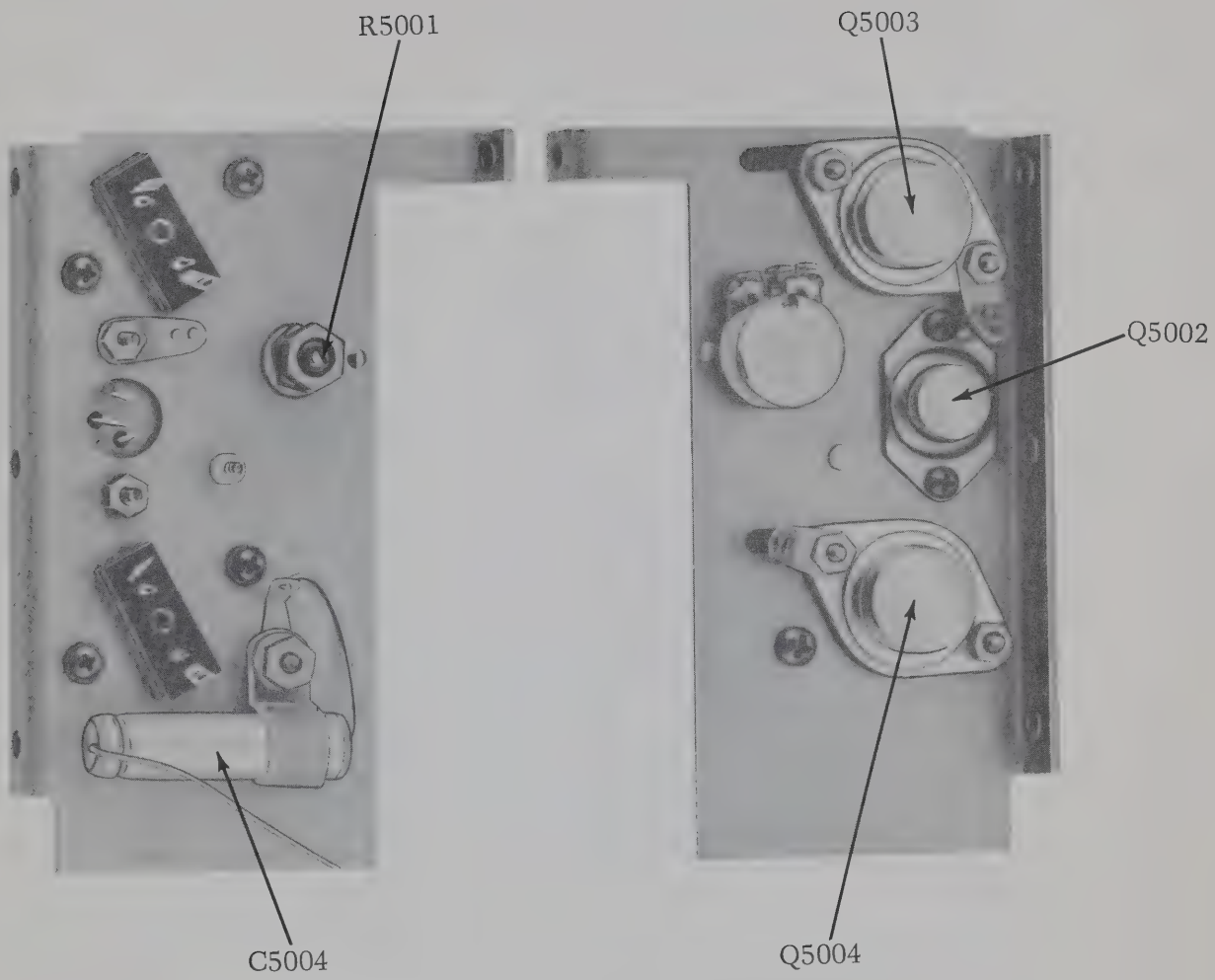


Figure 20. Power Supply Regulator Bracket

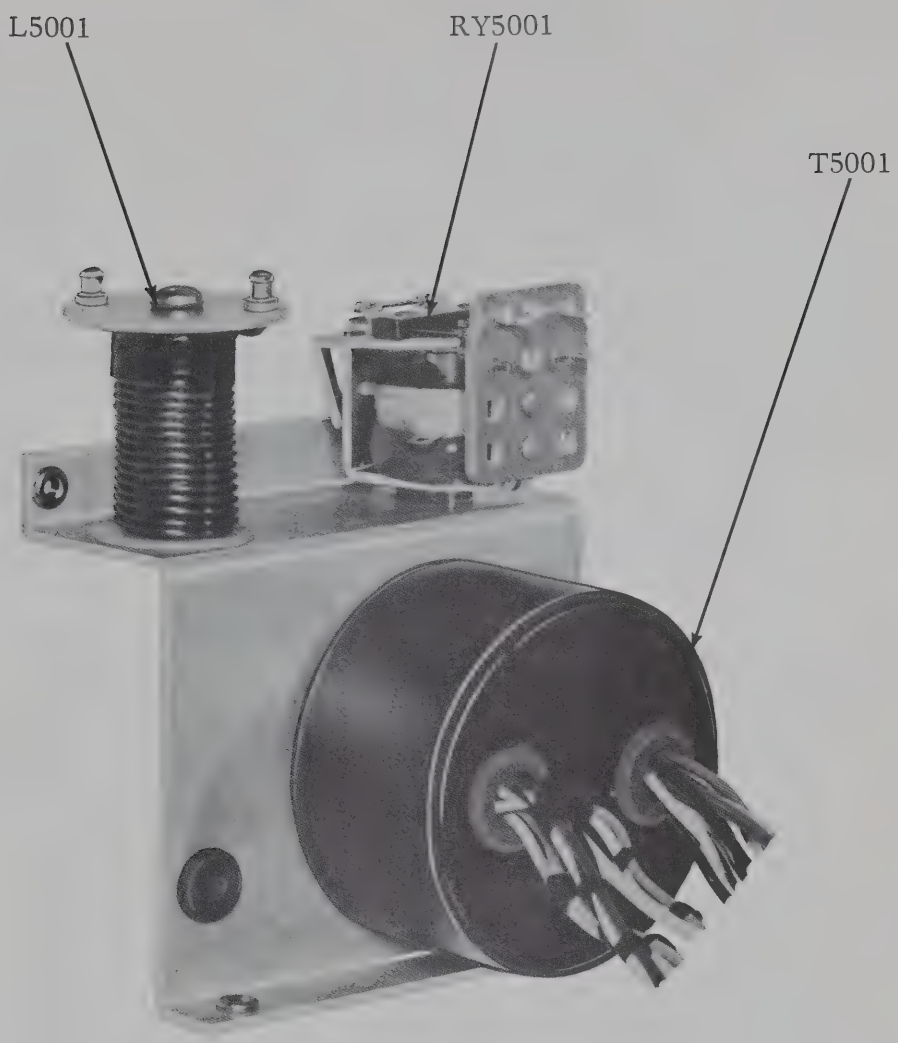


Figure 21. Power Supply Transformer Bracket

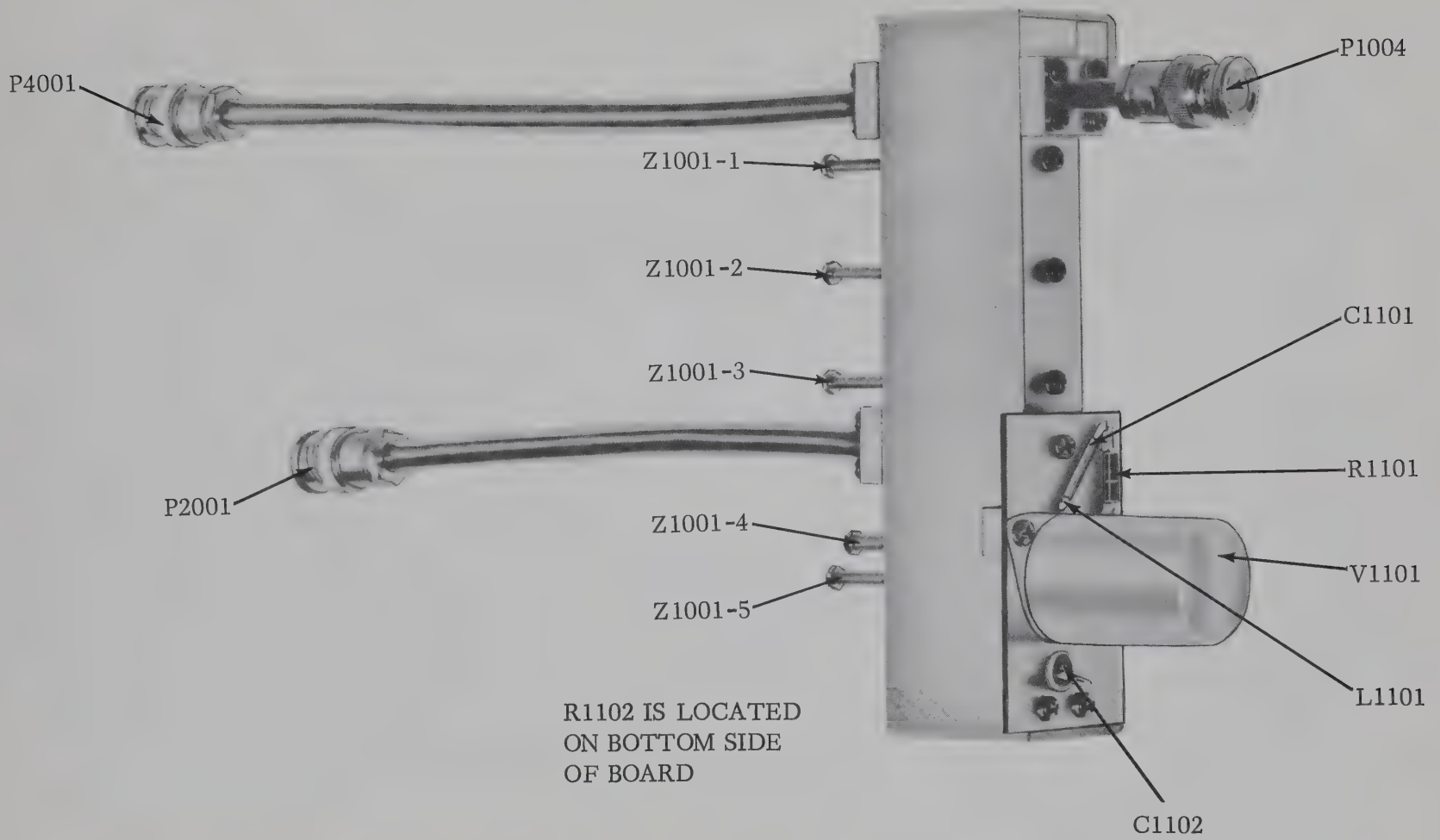


Figure 22. Preselector and Local Oscillator

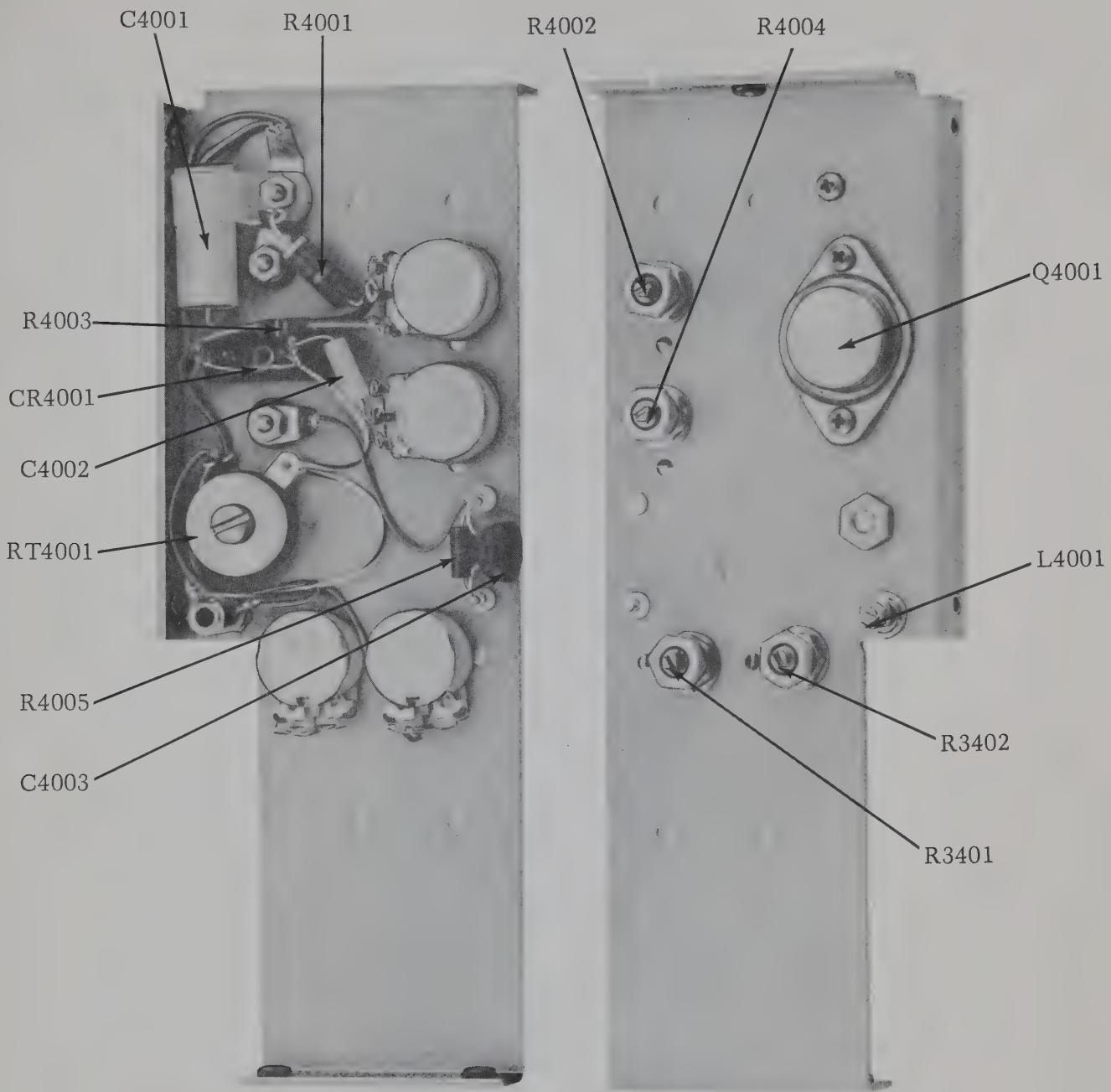


Figure 23. Modulator Bracket

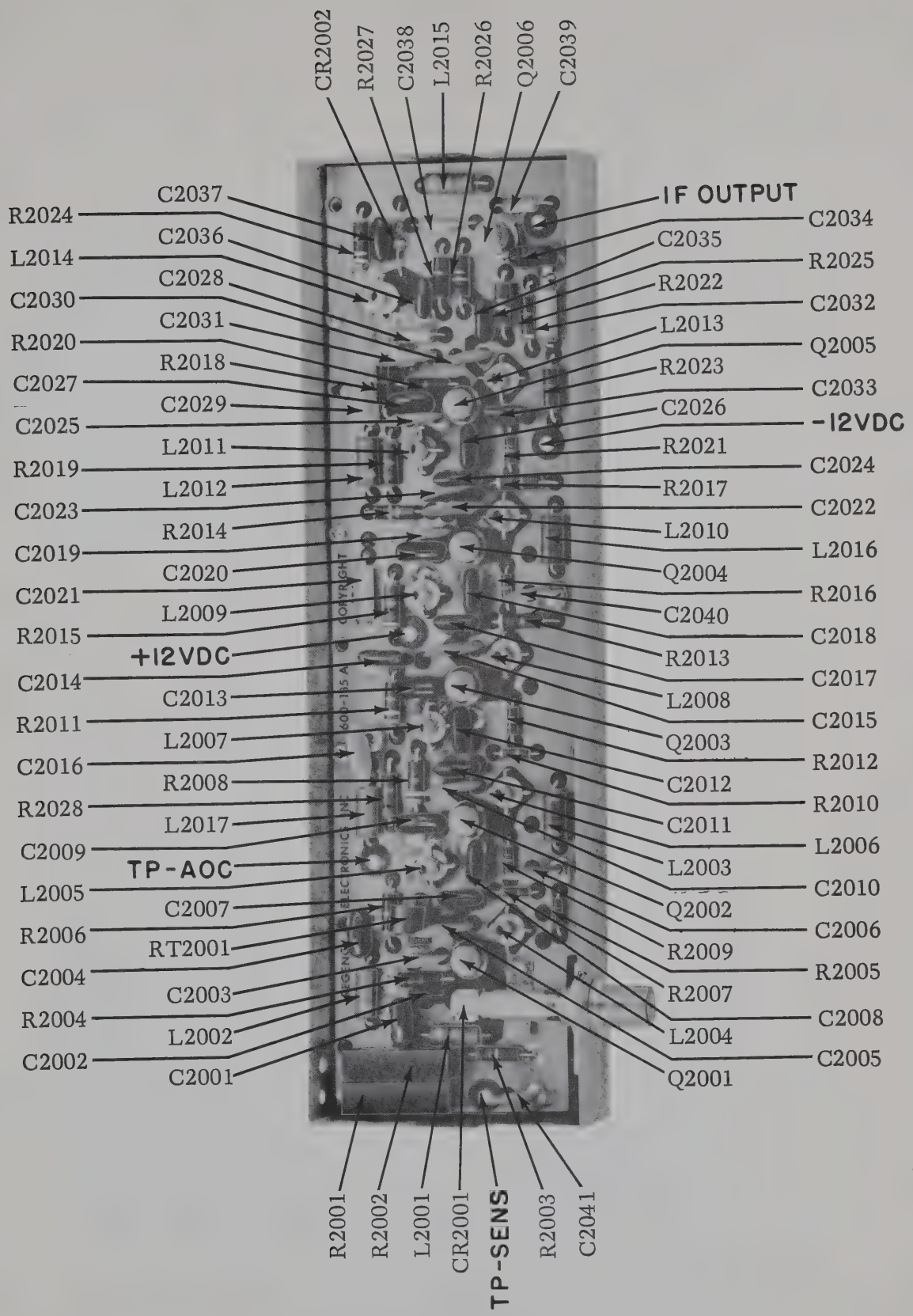


Figure 24. I-F Enclosure

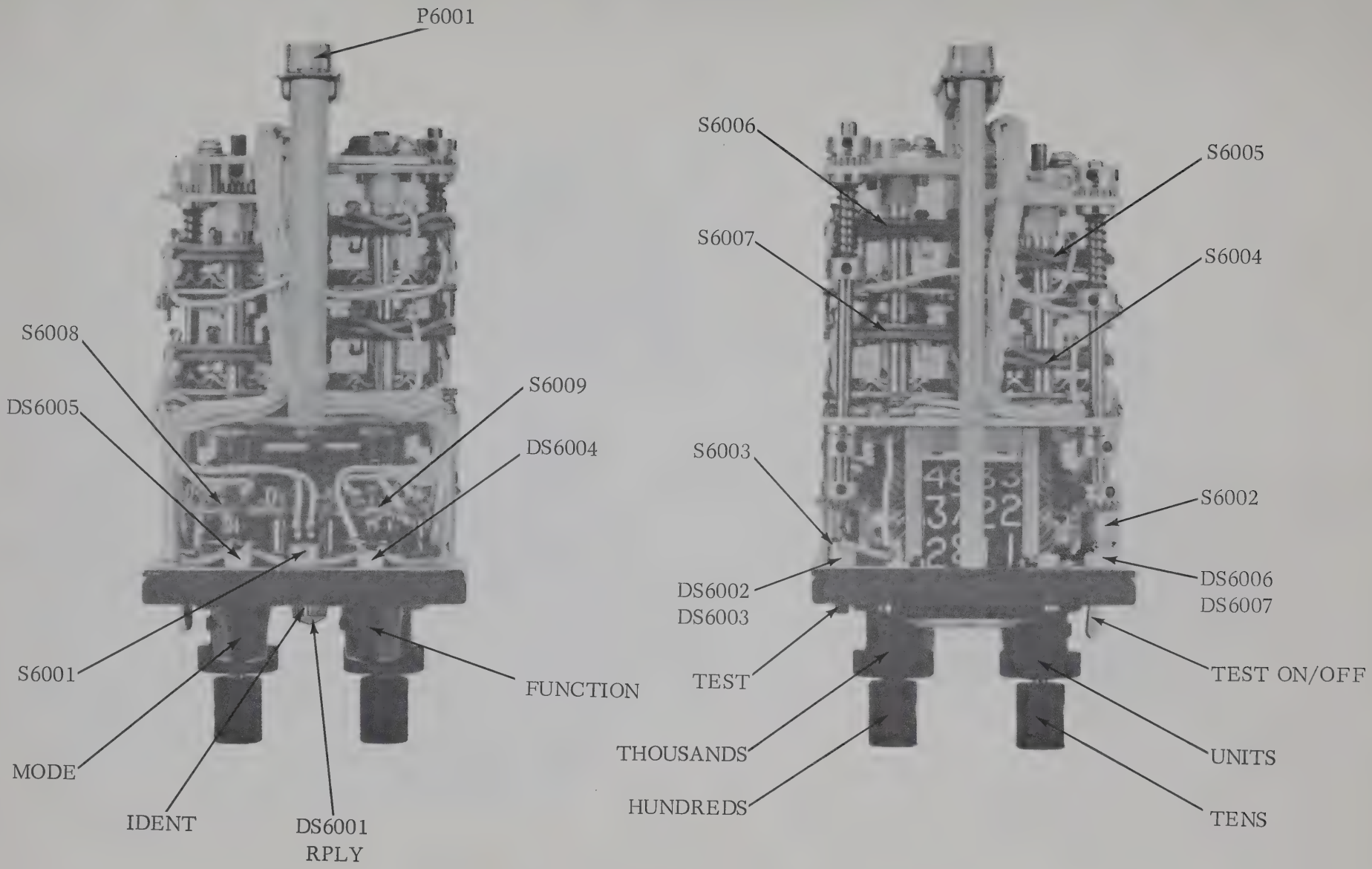


Figure 25. CONTROL HEAD (505 CH)

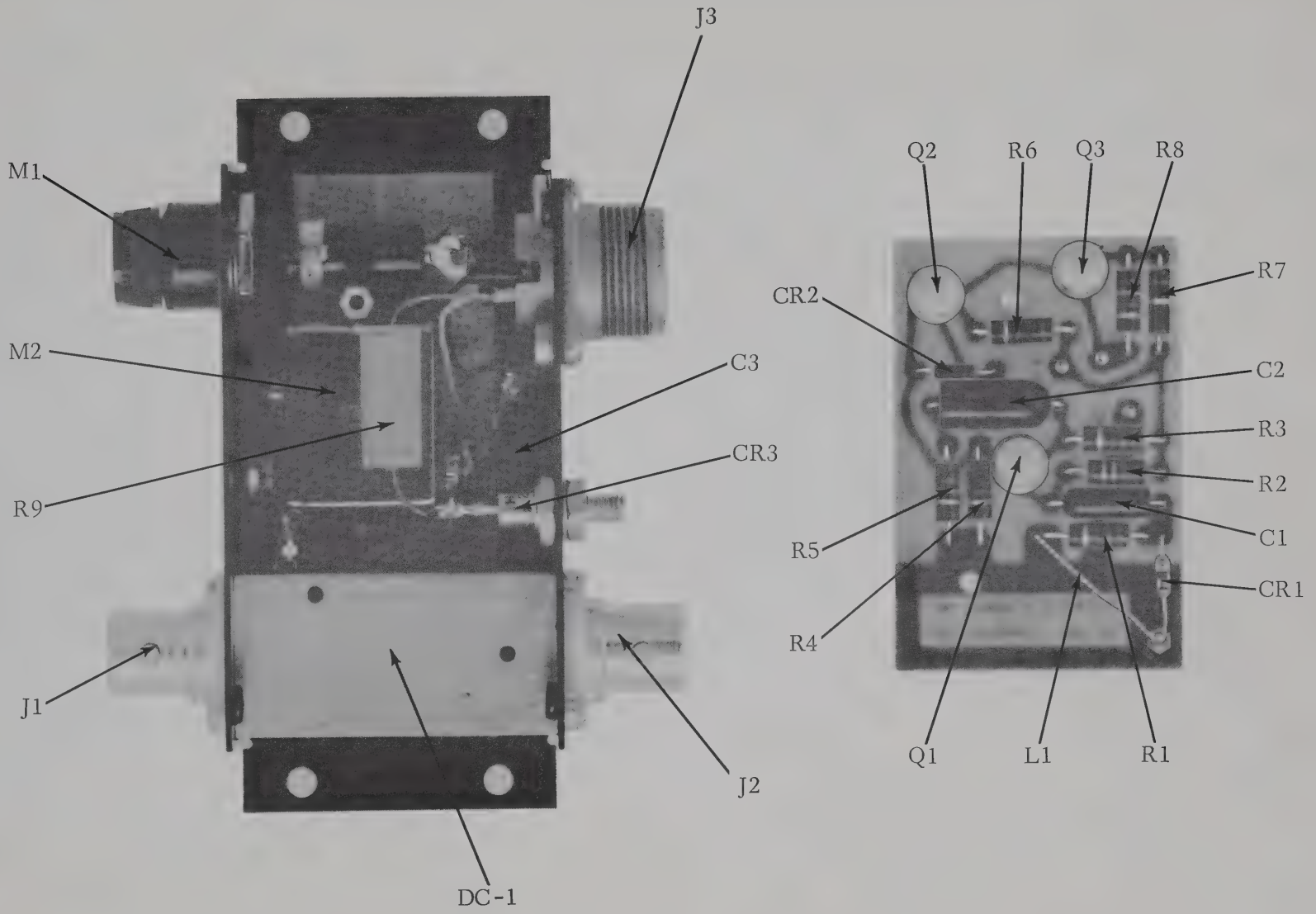


Figure 26. FUNCTION TESTER (505 FT)

NOTE :

All capicitors are in Picofarads unless otherwise specified.

Figure 27. RECEIVER-TRANSMITTER (505 RT) Schematic Diagram

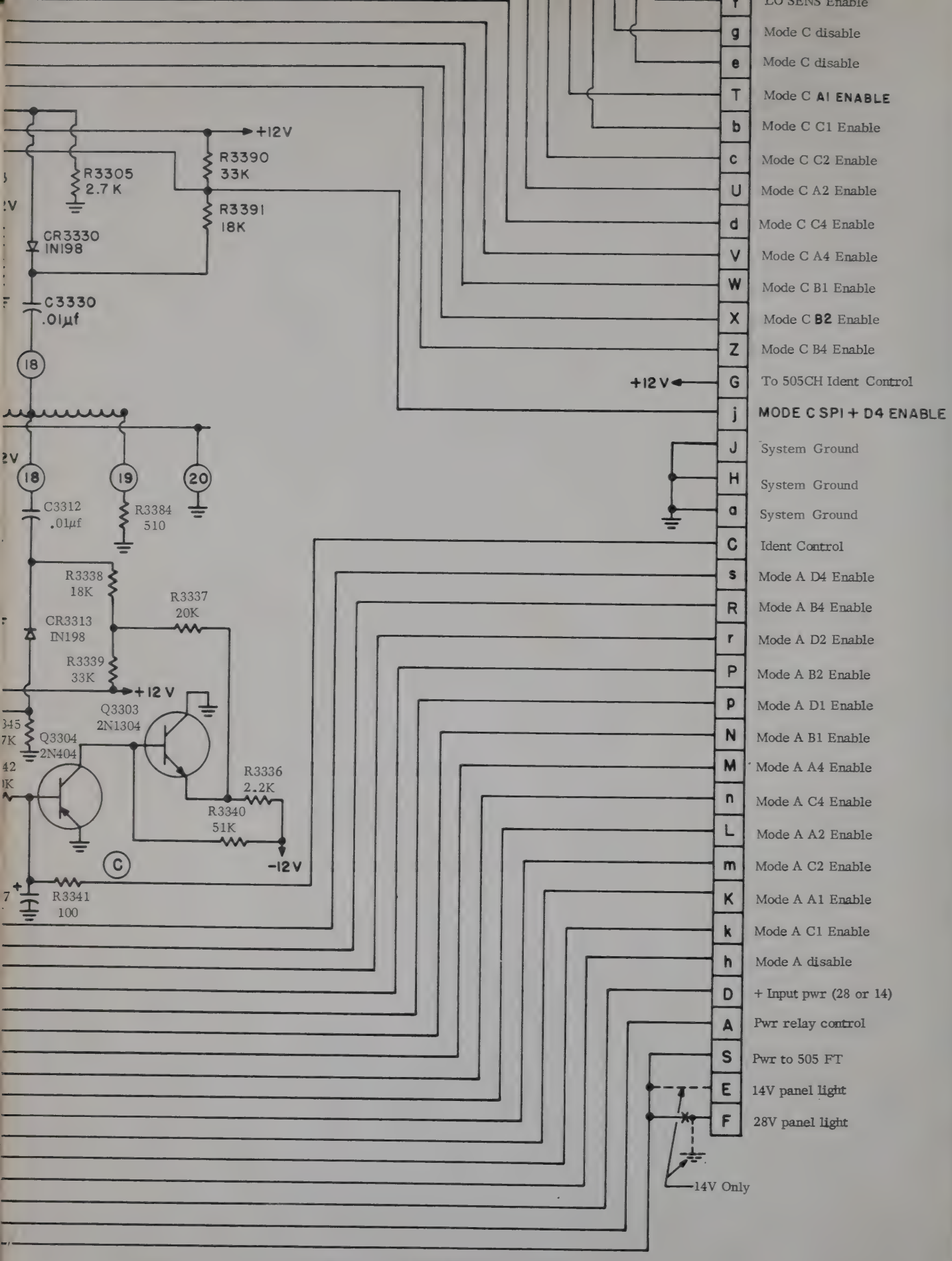
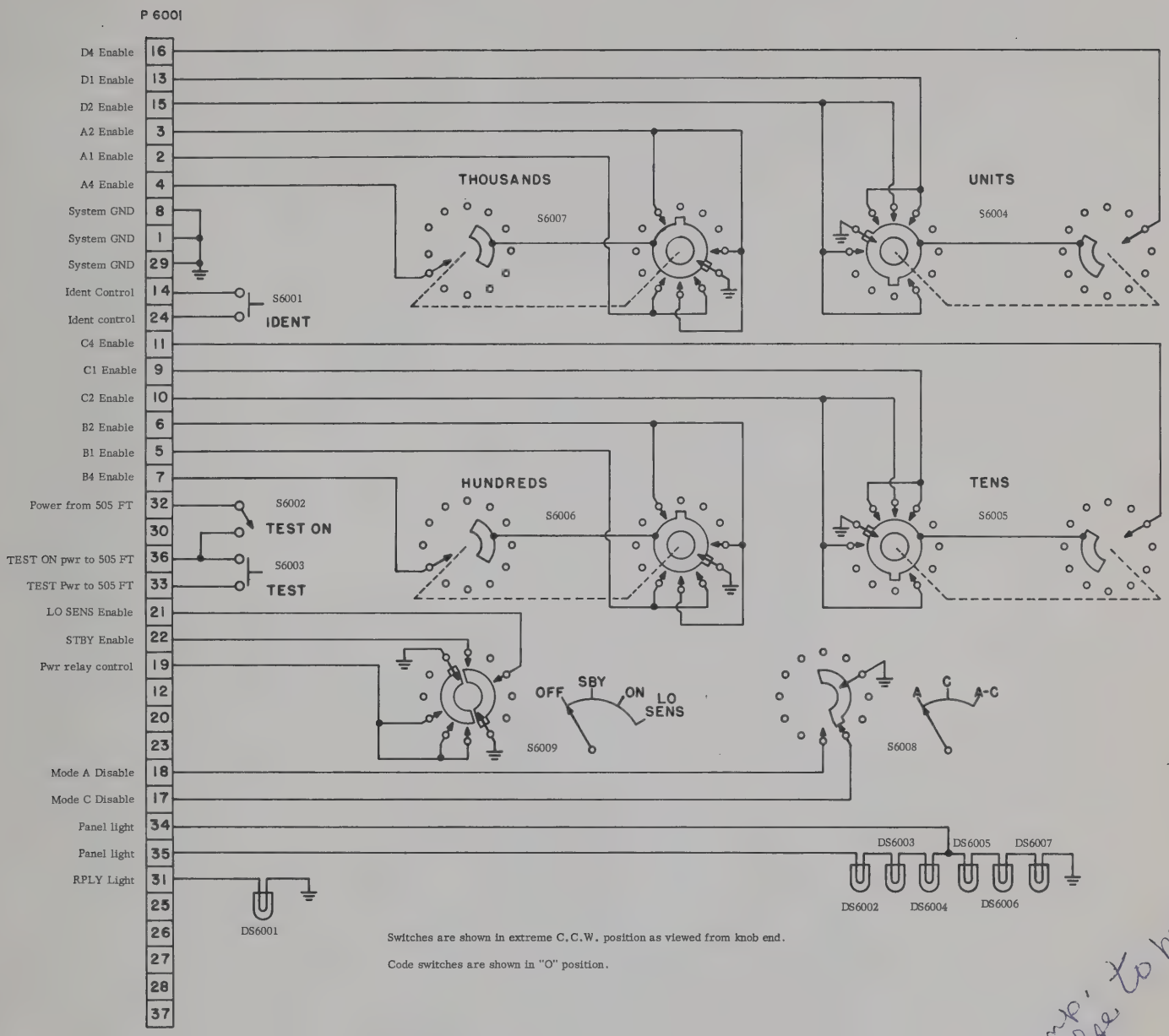


Figure 27. RECEIVER-TRANSMITTER (505 RT)
Schematic Diagram



Switches are shown in extreme C.C.W. position as viewed from knob end.

Code switches are shown in "O" position.

Q3205
3206
3207
3208

Encoder to read Pulse to modulator
Comp.

Figure 28. CONTROL HEAD (505 CH)
Schematic Diagram

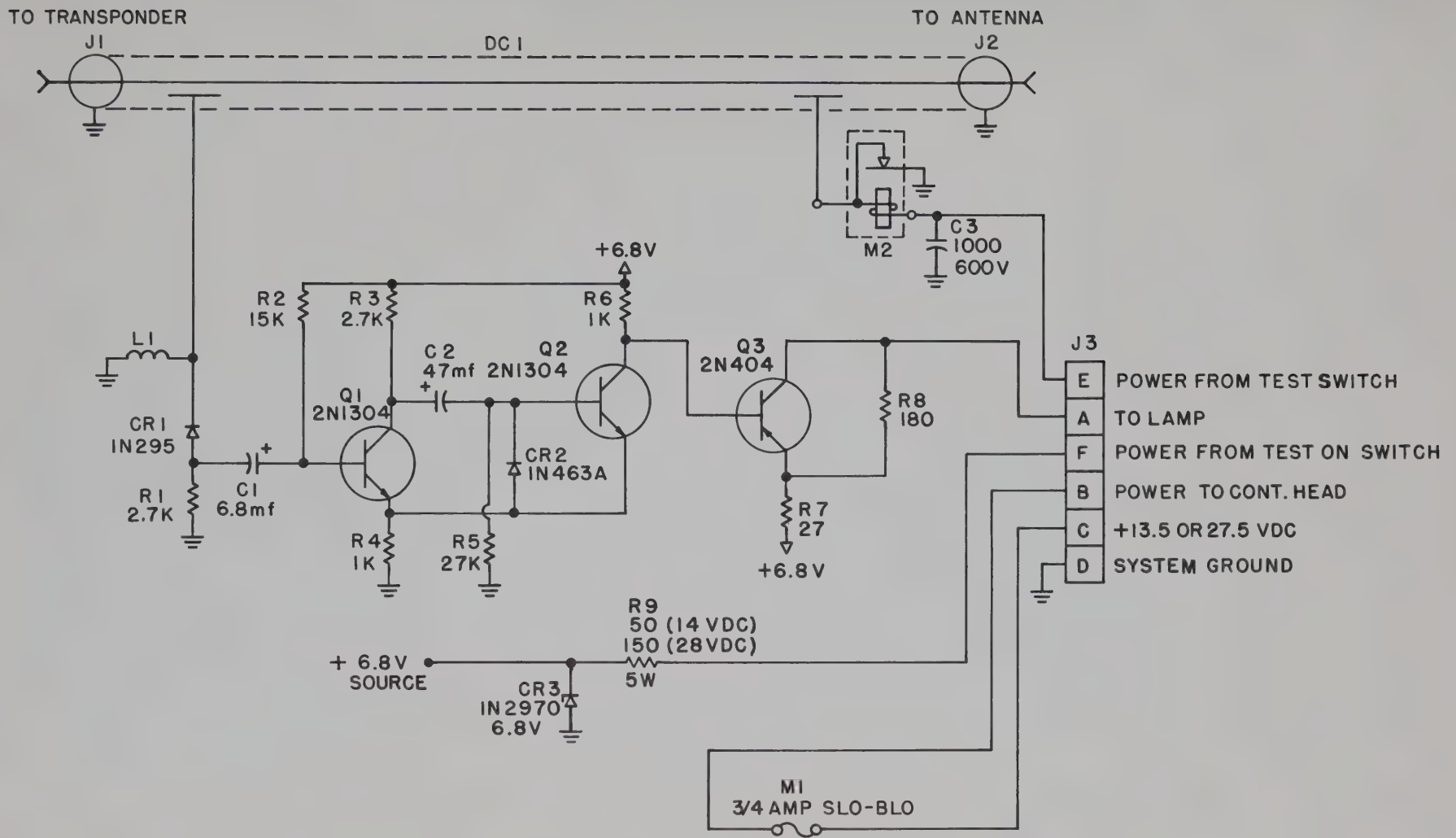


Figure 29. FUNCTION TESTER (505 FT)
Schematic Diagram

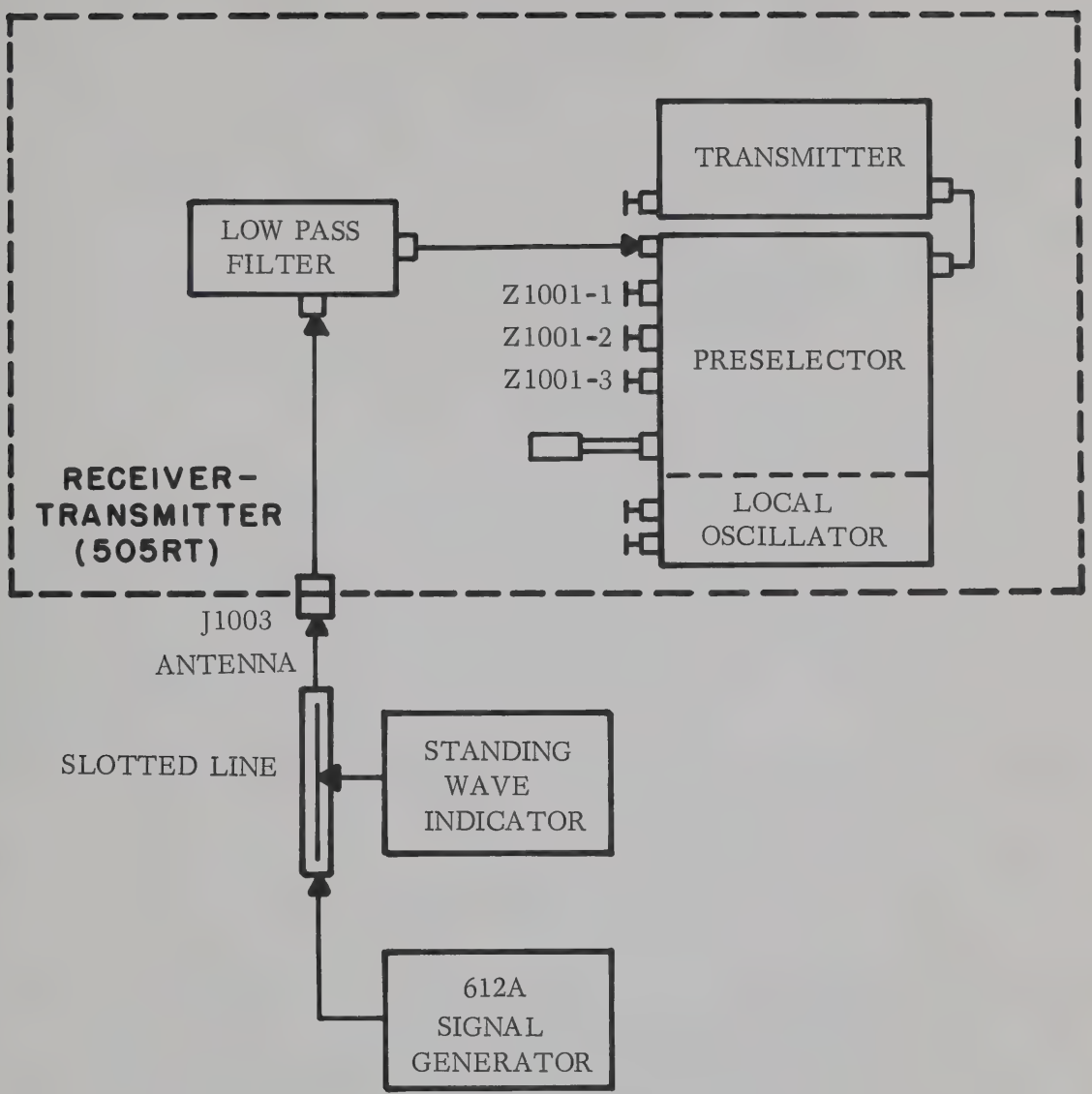


Figure 31. Preselector Alignment

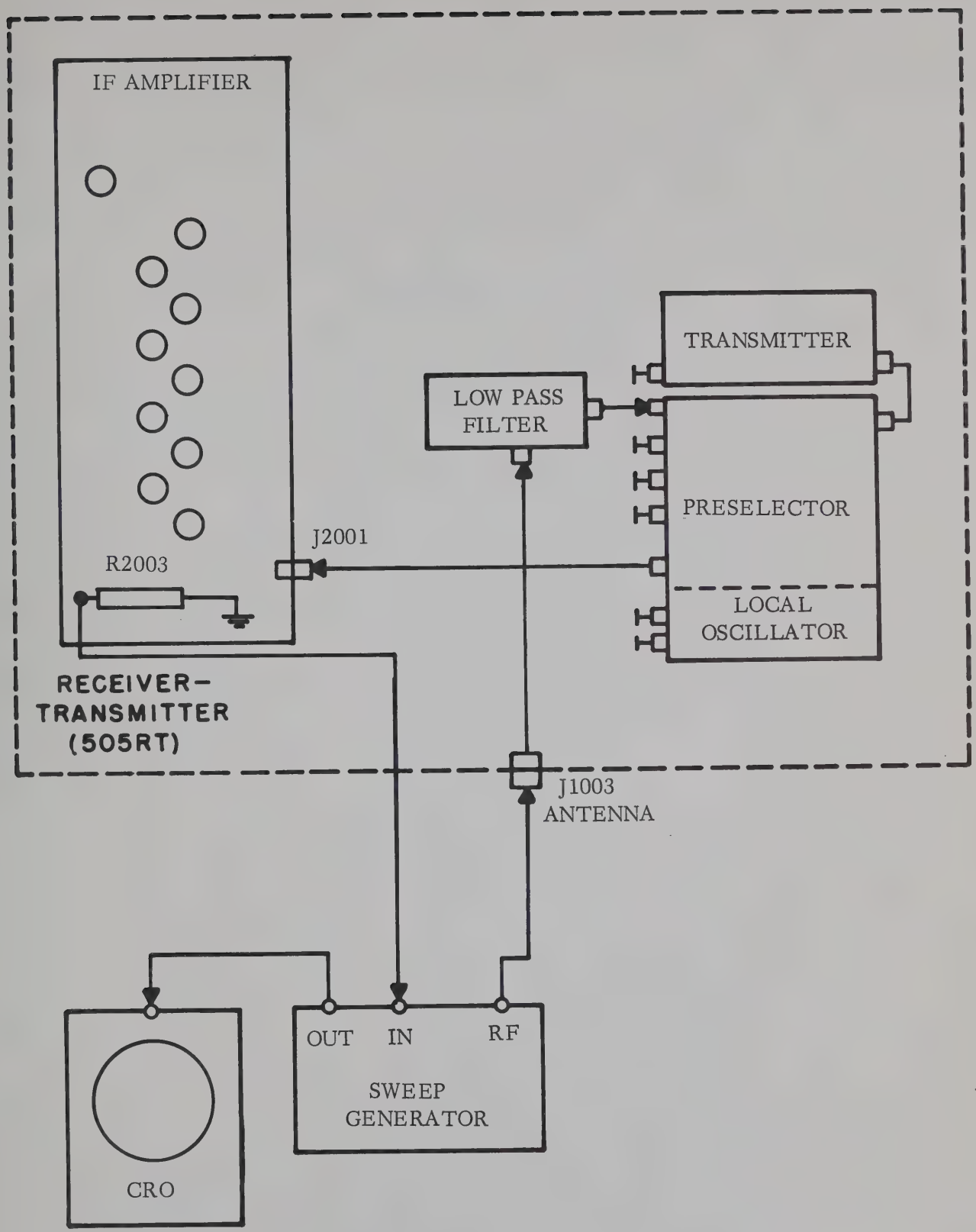


Figure 32. Preselector Adjustment

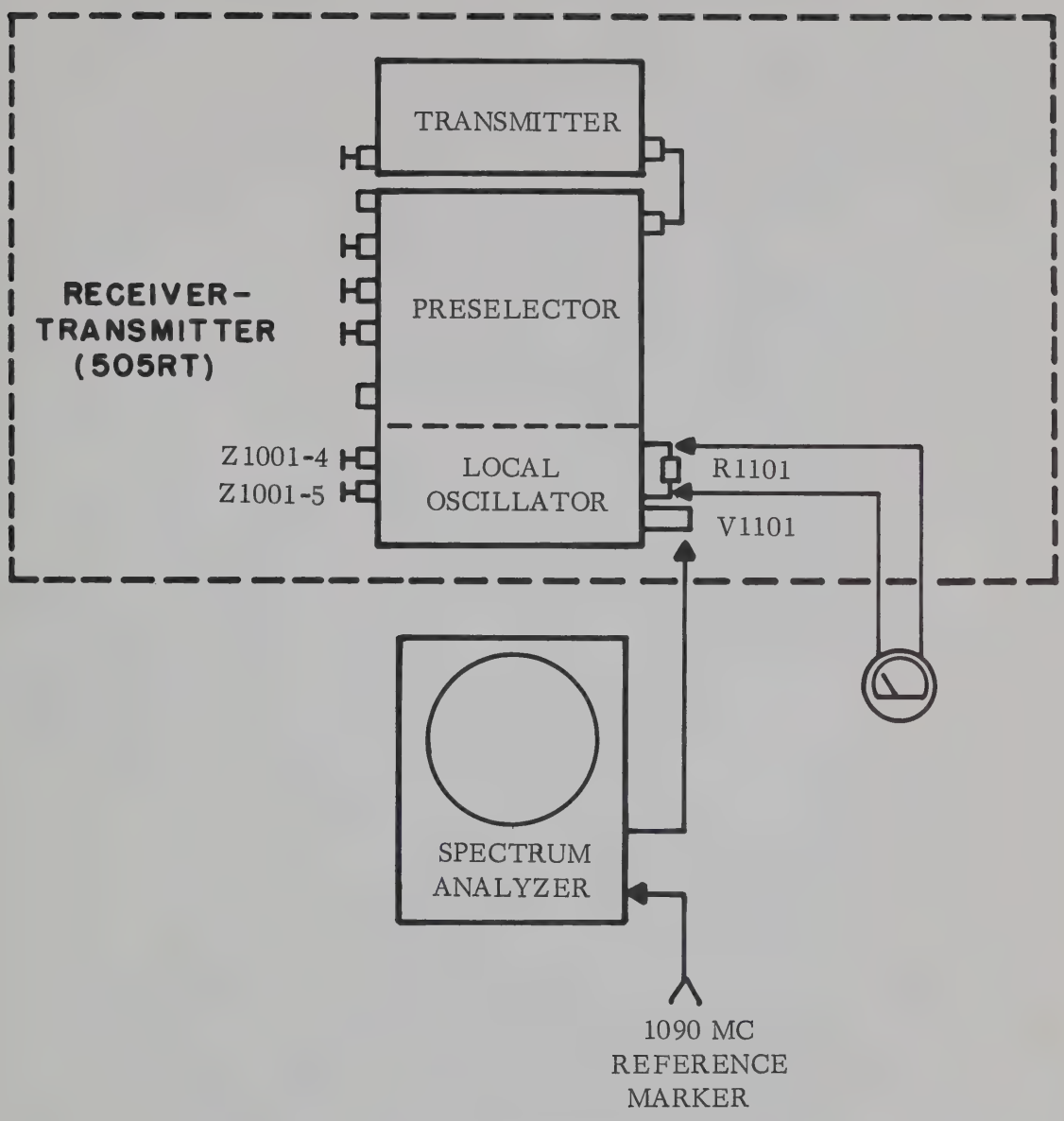


Figure 33. Local Oscillator Alignment

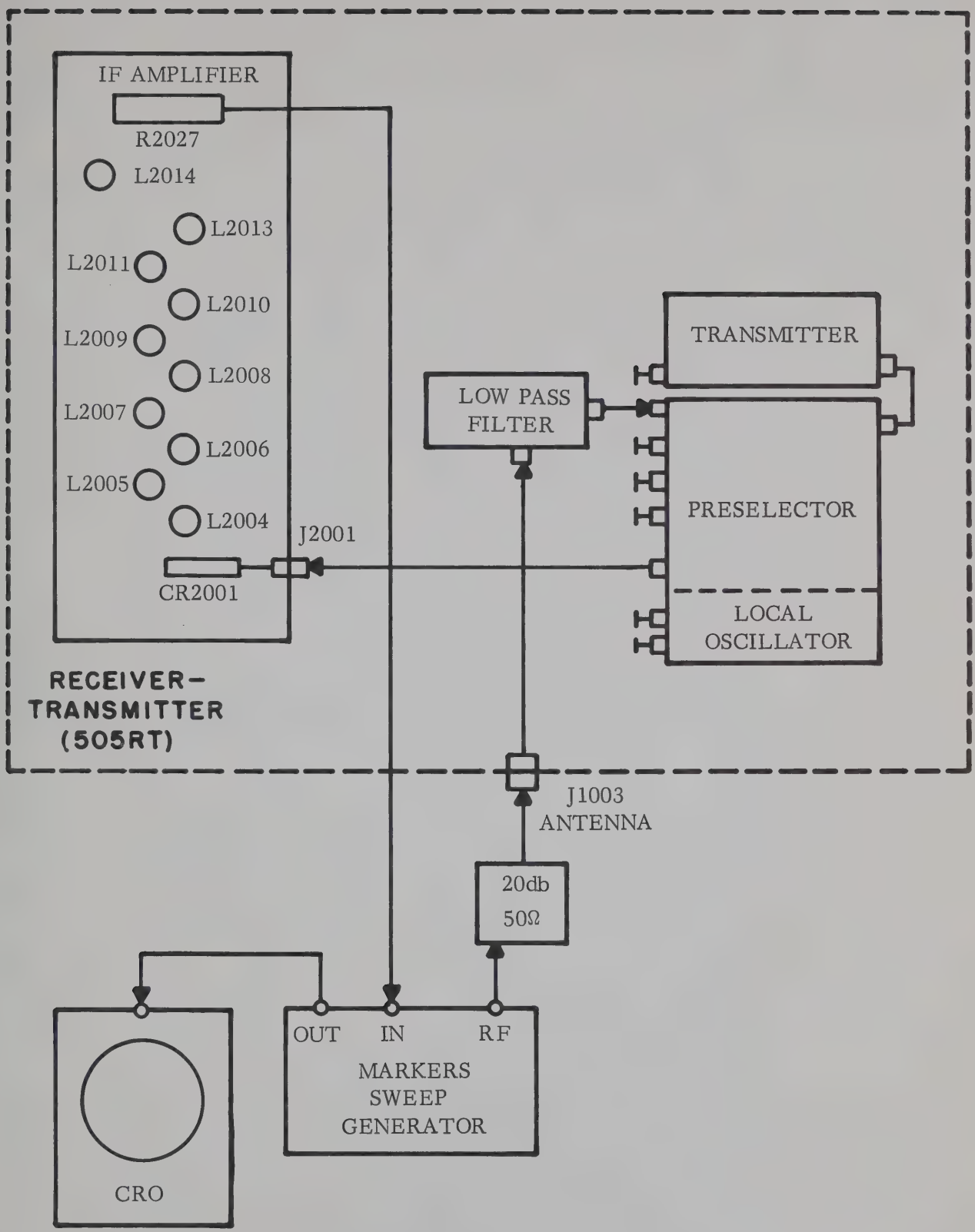


Figure 34. I-F Alignment

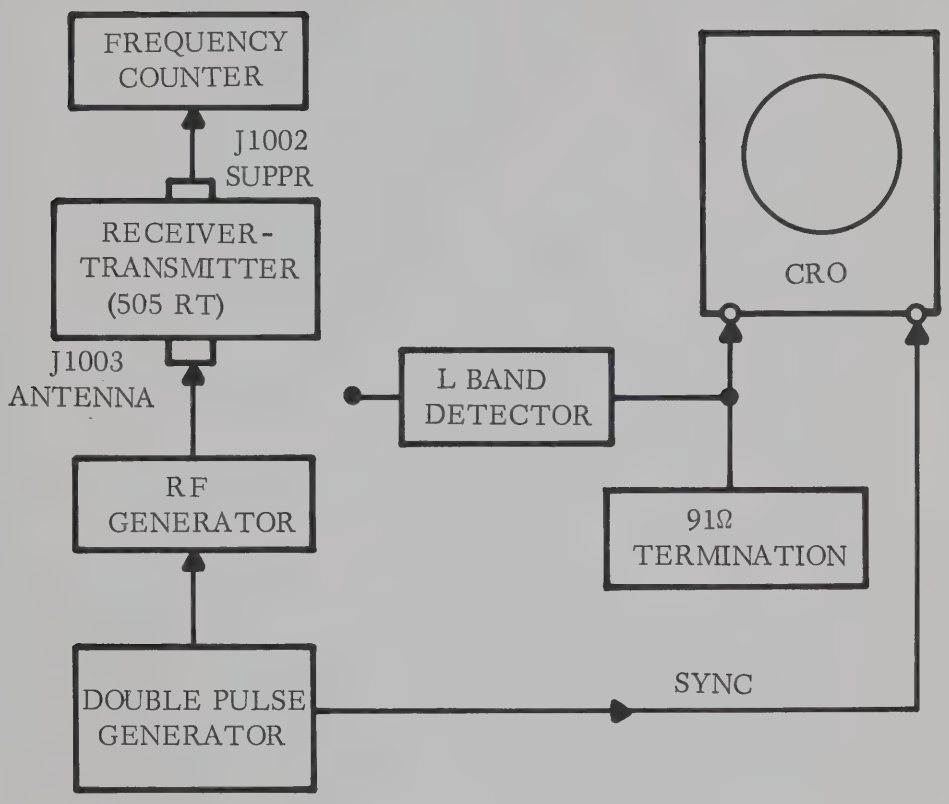


Figure 35. Receiver Sensitivity Test Setup

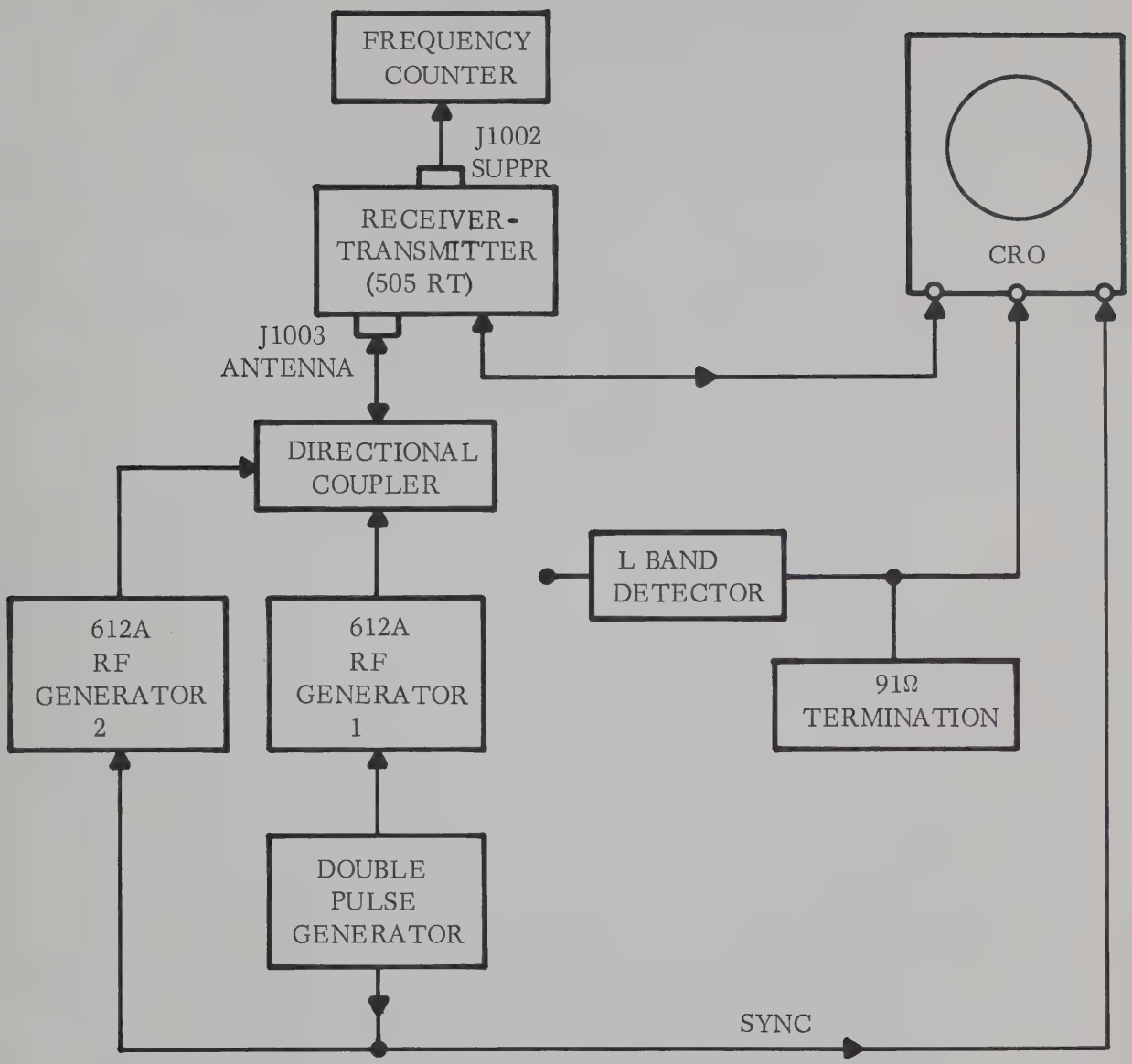


Figure 36 Side Lobe Suppression Test Setup

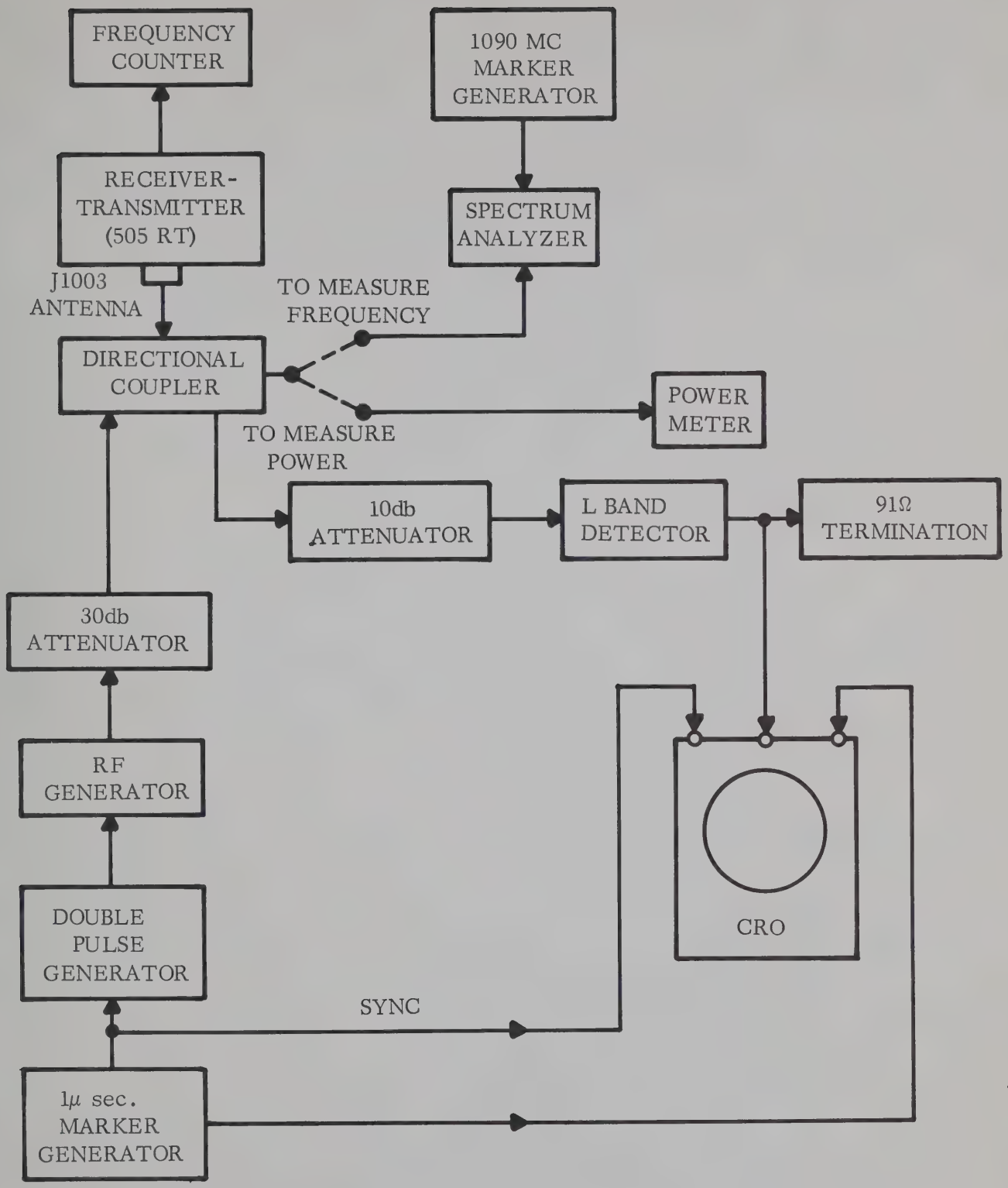


Figure 37. Receiver Test Setup

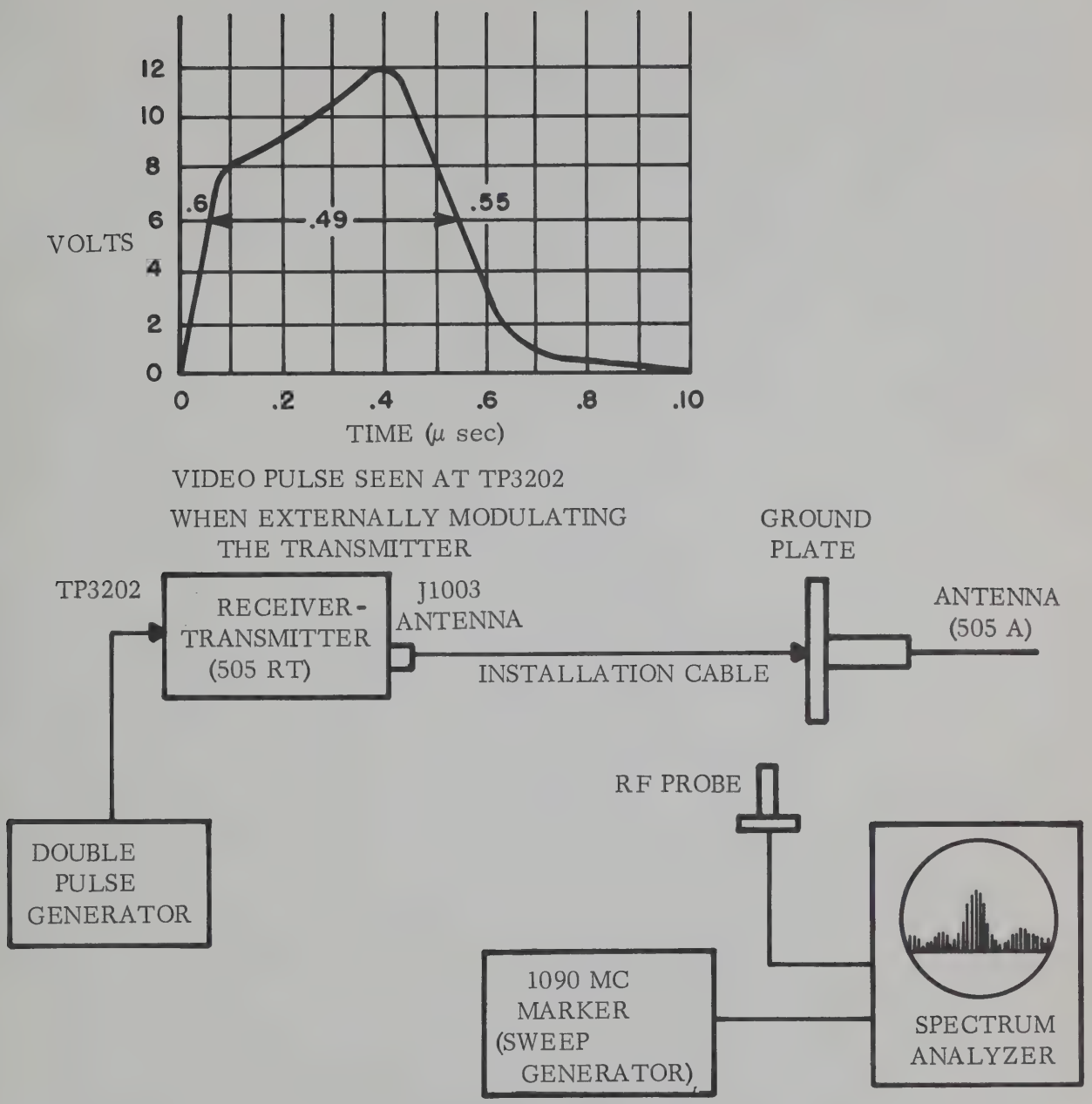


Figure 38. Frequency & Pulse Width Test Setup

SECTION 7

PARTS LIST

CODE TO MANUFACTURER LIST

ARC	ARCO ELECTRONICS, INC.
BEL	BELDON MANUFACTURING CO.
BOU	BOURNS LABORATORIES, INC.
BUS	BUSSMAN FUSE DIVISION OF McGRAW-EDISON CO.
CAN	CANNON ELECTRIC CO.
CCA	CONTROLS CO. OF AMERICA
CEN	CENTRALAB DIVISION OF GLOBE-UNION, INC.
COR	CORNELL-DUBLIER ELECTRIC CORP.
CTS	CTS CORP.
EDW	EDWARDS CO.
EIT	EITEL-McCULLOUGH, INC.
ERIE	ERIE RESISTOR CORP.
ESC	ESC CORP.
FEN	FENWAL ELECTRONICS, INC.
GAB	GABLES ENGINEERING CO.
GE	GENERAL ELECTRIC
GEM	GOOD-ALL ELECTRIC MFG. CO.
GRA	GRAYHILL, INC.
GRE	GREMAR MFG. CO., INC.
GUD	GUDEMAN CO.
IRC	INTERNATIONAL RESISTANCE CO.
JEF	JEFFERS ELECTRONICS DIVISION OF SPEER CARBON CO.
JAM	JAMES MILLER MFG. CO.
JWM	J.W. MILLER CO.
KEM	KEMET CO. DIVISION OF UNION CARBIDE CORP.
PHI	PHILCO CORP.
POT	POTTER AND BRUMFIELD DIVISION OF AMERICAN MACHINE AND FOUNDRY.
RCA	RADIO CORPORATION OF AMERICA
REG	REGENCY ELECTRONICS, INC.
SOL	SOLITRON DEVICES, INC.

Code to Manufacturer List (Cont.)

SPR	SPRAGUE ELECTRIC CO.
SYL	SYLVANIA ELECTRIC PRODUCTS , INC.
TEX	TEXAS INSTRUMENTS , INC.
*	MILITARY-APPROVED PART; ANY QUALIFIED MANUFACTURER IS APPLICABLE.

REFERENCE	DESCRIPTION	MFG.	PART NO.
C1	CAPACITOR, FIXED, ELECTROLYTIC: tantalum 6.8μf ± 20% 35V.	KEM	K6R8C35
C2	CAPACITOR, FIXED, ELECTROLYTIC: tantalum 47μf ± 20% 20V.	KEM	K47C20
C3	CAPACITOR, FIXED, CERAMIC DIELECTRIC: .001μf ± 20% 500V.	ERIE	TYPE 831
CR1	SEMICONDUCTOR DEVICE, DIODE: germanium	*	IN295
CR2	SEMICONDUCTOR DEVICE, DIODE: silicone	*	IN463A
CR3	SEMICONDUCTOR DEVICE, DIODE: zener 6.8V.	*	IN2970
DC1	SAMPLING LINE	REG	101-966
J1	CONNECTOR, PLUG, ELECTRICAL: male, coaxial type C	*	UG-568/U
J2	Same as J1		
J3	CONNECTOR, RECEPTICAL, ELECTRICAL: female, 6 contact	*	MS3102A-14S 6S
M1	FUSE, CARTRIDGE: 3/4 amp. 250V.	BUS	AGC
M2	BUZZER	EDW	TYPE 15-0
M3	Not used		
P1	CONNECTOR, PLUG, ELECTRICAL: female, coasial type C	*	UG-573A/U
P2	Same as P1		
Q1	TRANSISTOR: PNP, germanium	*	2N404
Q2	TRANSISTOR: NPN, germanium	*	2N1304
Q3	Same as Q2		
R1	RESISTOR, FIXED, COMPOSITION: 2700Ω ± 10% 1/2 watt	*	RC20GF272J
R2	RESISTOR, FIXED, COMPOSITION: 15000Ω ± 10% 1/2 watt	*	RC20GF153J
R3	Same as R1		
R4	RESISTOR, FIXED, COMPOSITION: 1000Ω ± 10% 1/2 watt	*	RC20GF102J
R5	RESISTOR, FIXED, COMPOSITION: 27000Ω ± 10% 1/2 watt	*	RC20GF273J

REFERENCE	DESCRIPTION	MFG.	PART NO.
R6	Same as R4		
R7	RESISTOR, FIXED, COMPOSITION: 27Ω ± 10% 1/2 watt	*	RC20GR270J
R8	RESISTOR FIXED, COMPOSITION: 180Ω ± 10% 1/2 watt	*	RC20GF181J
R9 (14V.)	RESISTOR, FIXED, WIREWOUND: 50Ω ± 10% 5 watt	IRC	PW-5
R9 (28V.)	RESISTOR, FIXED, WIREWOUND: 150Ω ± 10% 5 watt	IRC	PW-5
FL1001	FILTER, LOW PASS: Strip-line, 3 constant -K- sections and M- derived end sections; cut-off frequency 1750 mc.	REG	103340
J1001	CONNECTOR, RECEPTACLE, ELECTRICAL: male; 37 contacts	*	MS3102E-28-21P
J1002	CONNECTOR, RECEPTACLE, ELECTRICAL: female; coaxial; type BNC	*	UG-625/U
J1003	CONNECTOR, RECEPTACLE, ELECTRICAL: female; coaxial; type C	GRE	13199-1
J1004	CONNECTOR, RECEPTICAL, ELECTRICAL: female; coaxial; type BNC	GRE	11211
P1001	CONNECTOR, PLUG, ELECTRICAL: female; 37 contacts	*	MS3102A-28-21S
P1002	Not used		
P1003	CONNECTOR, PLUG, ELECTRICAL: male, coaxial, type C	*	UG-573A/U
P1004	CONNECTOR, PULG, ELECTRICAL: male, coaxial, type BNC	*	UG-88C/U
Z1001 (-1 to -5)	TUNED CIRCUITS: preselector and local oscillator assembly	REG	103351
C1101	CAPACITOR SLEEVE, PLATE LEAD	REG	101-993
C1102	CAPACITOR, FIXED, MICA DIELECTRIC: feed thru, 50pf ± 10%, 250V.	ERIE	2930004 18 AO 500M
L1101	CHOKE, RF: Wire, 22 Ga. (19/34) Teflon insulated, 1000V., 200°C.	BEL	8326
R1101	RESISTOR, FIXED, COMPOSITION: 100 Ω ± 5% 1/2 watt	*	RC20GF101J

REFERENCE	DESCRIPTION	MFG.	PART NO.
R1102	RESISTOR, FIXED, COMPOSITION: 3300Ω ± 5% 1/4 watt	*	RC07GF332J
V1101	ELECTRON TUBE: triode	SYL	7738
C2001	CAPACITOR FIXED, MICA DIELECTRIC: 680pf ± 5% 300V.	ARC	DM15F681J
C2002	CAPACITOR, FIXED, MICA DIELECTRIC: 100pf ± 5% 500V.	ARC	DM15F101J
C2003	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 5100pf +25% -10% 300V.	CEN	DA-062-008B
C2004	Same as C2001		
C2005	Same as C2003		
C2006	Same as C2003		
C2007	CAPACITOR, FIXED, MICA DIELECTRIC: 5pf ± 5% 500V.	ARC	DM-15C050J
C2008	CAPACITOR, FIXED, MICA DIELECTRIC: 75pf ± 5% 500V.	ARC	DM-15F750J
C2009	Same as C2001		
C2010	Same as C2003		
C2011	Same as C2007		
C2012	Same as C2008		
C2013	Same as C2001		
C2014	CAPACITOR, FIXED, MICA DIELECTRIC 0.033μf ± 10% 50V.	GEM	601 PE
C2015	Same as C2003		
C2016	Same as C2003		
C2017	Same as C2007		
C2018	Same as C2008		
C2019	Same as C2003		
C2020	Same as C2001		
C2021	CAPACITOR, FIXED, ELECTROLYTIC: tantalum, 22μf ± 20% 15V.	TEX	SCM226BP015-D4
C2022	Same as C2003		
C2023	Same as C2003		

REFERENCE	DESCRIPTION	MFG.	PART NO.
C2024	Same as C2007		
C2025	Same as C2003		
C2026	Same as C2008		
C2027	Same as C2001		
C2028	CAPACITOR, FIXED, ELECTROLYTIC: tantalum, 3.3μf ± 20% 15V.	TEX	SCM335FP015-D4
C2029	Same as C2003		
C2030	Same as C2003		
C2031	Same as C2003		
C2032	Same as C2021		
C2033	CAPACITOR, FIXED, MICA DIELECTRIC: 1pf ± 5% 500V.	ARC	DM15C010J
C2034	Same as C2001		
C2035	CAPACITOR, FIXED, MICA DIELECTRIC: 3pf ± 5% 500V.	ARC	DM15C030J
C2036	Same as C2007		
C2037	CAPACITOR, FIXED, MICA DIELECTRIC: 10pf ± 5% 500V.	ARC	DM15F100J
C2038	Same as C2028		
C2039	Same as C2028		
C2040	Same as C2003		
C2041	Same as C2003		
CR2001	SEMICONDUCTOR DEVICE, DIODE: mixer	*	IN21C
CR2002	SEMICONDUCTOR DEVICE, DIODE: PIV 50V	*	IN295
J2001	CONNECTOR, RECEPTICAL, ELECTRICAL: female, coaxial type BNC	*	UG-625B/U
L2001	CHOKE, RADIO FREQUENCY: 1.5μh	JEF	JE441-10M
L2002	CHOKE, RADIO FREQUENCY: 3.3μh	JEF	JE4421-1K
L2003	Same as L2002		

REFERENCE	DESCRIPTION	MFG.	PART NO.
L2004	COIL ASSEMBLY: collector	REG	101-972-2
L2005	COIL ASSEMBLY: base	REG	101-972-1
L2006	Same as L2004		
L2007	Same as L2005		
L2008	Same as L2004		
L2009	Same as L2005		
L2010	Same as L2004		
L2011	Same as L2005		
L2012	Same as L2002		
L2013	Same as L2004		
L2014	Same as L2004		
L2015	Same as L2002		
L2016	Same as L2002		
L2017	Same as L2002		
P2001	CONNECTOR, PLUG, ELECTRICAL: male, coaxial type BNC	*	UG-88C/U
Q2001	TRANSISTOR, PNP: germanium, total dissipation 60mw	PHI	2N1745
Q2002	Same as Q2001		
Q2003	Same as Q2001		
Q2004	Same as Q2001		
Q2005	Same as Q2001		
Q2006	TRANSISTOR, PNP: germanium	RCA	2N404A
R2001	RESISTOR, VARIABLE, COMPOSITION: 2,000Ω	BOU	3067S-1-202-2K
R2002	Same as R2001		
R2003	Same as R1101	*	RC20GF101J
R2004	Same as R1101		
R2005	RESISTOR, FIXED, COMPOSITION: 18000Ω ± 5% 1/4 watt	*	RC07GF183J

REFERENCE	DESCRIPTION	MFG.	PART NO.
R2006	RESISTOR, FIXED, COMPOSITION: 3000Ω ± 5% 1/2watt	*	RC20GF302J
R2007	RESISTOR, FIXED, COMPOSITION: 470Ω ± 5% 1/4 watt	*	RC07GF471J
R2008	RESISTOR, FIXED, COMPOSITION: 3900 ± 5% 1/2 watt	*	RC20GF392J
R2009	Same as R2005		
R2010	Same as R2007		
R2011	Same as R2008		
R2012	Same as R3144		
R2013	RESISTOR, FIXED, COMPOSITION: 47Ω ± 5% 1/2 watt	*	RC20GF470J
R2014	RESISTOR, FIXED, COMPOSITION: 15000Ω ± 5% 1/2 watt	*	RC20GF153J
R2015	Same as R2013		
R2016	Same as R3144		
R2017	Same as R2013		
R2018	RESISTOR, FIXED, COMPOSITION: 7500Ω ± 5% 1/2 watt	*	RC20GF752J
R2019	RESISTOR, FIXED, COMPOSITION: 5100Ω ± 5% 1/2 watt	*	RC20GF512J
R2020	Same as R2006		
R2021	Same as R2005		
R2022	Same as R2013		
R2023	Same as R2013		
R2024	RESISTOR, FIXED, COMPOSITION: 4300Ω ± 5% 1/2 watt	*	RC20GF432J
R2025	RESISTOR, FIXED, COMPOSITION: 150000Ω ± 5% 1/2 watt	*	RC20GF154J
R2026	RESISTOR, FIXED, COMPOSITION: 10000Ω ± 5% 1/2 watt	*	RC20GF103J
R2027	RESISTOR, FIXED, COMPOSITION: 1500Ω ± 5% 1/2 watt	*	RC20GF152J
R2028	Same as R2004		

REFERENCE	DESCRIPTION	MFG.	PART NO.
RT2001	THERMISTOR: 3000Ω ± 10% at 25 deg. C.	FEN	CA33J1
C3101	CAPACITOR, FIXED, MICA DIELECTRIC: 560pf ± 5% 300V.	ARC	DM15F561J
C3102	CAPACITOR, FIXED, MICA DIELECTRIC: 270pf ± 5% 500V.	ARC	CM15C271J
C3103	CAPACITOR, FIXED, PLASTIC DIELECTRIC: 0.0047μf ± 10% 100V.	COR	WMF1D47
C3104	CAPACITOR, FIXED, MICA: 1000pf ± 5% 100V.	ARC	DM15F102J
C3105	CAPACITOR FIXED, MICA DIELECTRIC: 470pf ± 5% 300V.	ARC	CM15C471J
C3106	CAPACITOR, FIXED, ELECTROLYTIC: tantalum, 68μf ± 20% 15V.	TEX	SCM686GPO15-D4
C3107	CAPACITOR, FIXED, ELECTROLYTIC: tantalum, 3.3μf ± 20% 15V.	TEX	SCM335FPO15-D4
C3108	Not used		
C3109	CAPACITOR, FIXED, MICA DIELECTRIC: 330pf ± 5% 500V.	ARC	CM15C331J
C3110	CAPACITOR, FIXED, PLASTIC DIELECTRIC: 0.01μf ± 10% 100V.	COR	WMF1S1
C3111	Same as C3103		
C3112	Same as C3110		
C3113	CAPACITOR, FIXED, PLASTIC DIELECTRIC: 0.047μf ± 10% 100V.	COR	WMF1S47
C3114	Same as C3107		
C3115	Same as C3113		
C3116	Same as C3105		
C3117	Same as C3104		
C3118	Same as C3102		
C3119	Same as C3110		
C3120	CAPACITOR, FIXED, MICA DIELECTRIC: 390pf ± 5% 500V.	ARC	CM15C391J
C3121	Same as C3102		
C3122	Same as C3104		

REFERENCE	DESCRIPTION	MFG.	PART NO.
C3123	Same as C3110		
C3124	CAPACITOR, FIXED, PLASTIC DIELECTRIC: 0.001μf ± 10% 100V.	COR	WMF1D1
C3125	CAPACITOR, FIXED, ELECTROLYTIC: tantalum 22μf ± 20% 15V.	TEX	SCM226BPO15-D4
CR3101	SEMICONDUCTOR DEVICE, DIODE: germanium	*	IN277
CR3102	SEMICONDUCTOR DEVICE, DIODE: germanium	*	IN198
CR3103	Same as CR3102		
CR3104	Same as CR3102		
CR3105	Same as CR3102		
CR3106	Same as CR3102		
CR3107	Same as CR3102		
CR3108	Same as CR3102		
CR3109	Same as CR3102		
CR3110	Same as CR3102		
CR3111	Same as CR3102		
CR3112	Same as CR3102		
CR3113	Same as CR3102		
L3101	CHOKE, RADIO FREQUENCY: 12μh	JEF	JE4421-8K
L3102	CHOKE, RADIO FREQUENCY: 25μh	JAM	J300-25
Q3101	TRANSISTOR: PNP, germanium	*	2N404
Q3102	Same as Q3101		
Q3103	TRANSISTOR: NPN, germanium	*	2N1304
Q3104	Same as Q3103		
Q3105	Same as Q3101		
Q3106	Same as Q3101		
Q3107	TRANSISTOR: PNP, germanium	*	2N404A
Q3108	TRANSISTOR: alloy junction type	RCA	2N1605A
Q3109	Same as Q3101		
Q3110	Same as Q3103		
Q3111	Same as Q3101		

REFERENCE	DESCRIPTION	MFG.	PART NO.
Q3112	Same as Q3101		
Q3113	Same as Q3101		
Q3114	Same as Q3101		
Q3115	Same as Q3101		
Q3116	Same as Q3103		
R3101	RESISTOR, FIXED, COMPOSITION: 2000Ω ± 5% 1/4 watt	*	RC07GF202J
R3102	RESISTOR, VARIABLE, COMPOSITION: 20,000Ω	BOU	3068P-1-203
R3103	RESISTOR, FIXED, COMPOSITION: 5100Ω ± 5% 1/2 watt	*	RC07GF512J
R3104	RESISTOR, FIXED, COMPOSITION: 300Ω ± 5% 1/4 watt	*	RC07GF301J
R3105	RESISTOR, FIXED, COMPOSITION: 36 Ω ± 5% 1/4 watt	*	RC07GF360J
R3106	RESISTOR, FIXED, COMPOSITION: 20000 ± 5% 1/4 watt	*	RC07GF203J
R3107	RESISTOR, FIXED, COMPOSITION: 36,000Ω ± 5% 1/4 watt	*	RC07GF363J
R3108	RESISTOR, FIXED, COMPOSITION: 82,000Ω ± 5% 1/4 watt	*	RC07GF823J
R3109	Not used		
R3110	RESISTOR, FIXED, COMPOSITION: 150,000Ω ± 5% 1/4 watt	*	RC07GF154J
R3111	RESISTOR, FIXED, COMPOSITION: 1000Ω ± 5% 1/4 watt	*	RC07GF102J
R3112	RESISTOR, FIXED, COMPOSITION: 1,500,000 ± 5% 1/4 watt	*	RC07GF155J
R3113	RESISTOR, FIXED, COMPOSITION: 330,000Ω ± 5% 1/4 watt	*	RC07GF334J
R3114	Same as R3103		
R3115	Same as R3103		
R3116	Same as R2005	*	

REFERENCE	DESCRIPTION	MFG.	PART NO.
R3117	RESISTOR, FIXED, COMPOSITION: 2200Ω ± 5% 1/4 watt	*	RC07GF222J
R3118	Same as R3103		
R3119	Same as R3117		
R3120	Not used		
R3121	RESISTOR, FIXED, COMPOSITION: 33000Ω ± 5% 1/4 watt	*	RC07GF333J
R3122	Same as R3111		
R3123	Same as R3111		
R3124	RESISTOR, FIXED, COMPOSITION: 150Ω ± 5% 1/4 watt	*	RC07GF151J
R3125	Same as R3117		
R3126	Same as R1102		
R3127	Same as R3121		
R3128	Same as R2007		
R3129	Same as R1102		
R3130	RESISTOR, FIXED, COMPOSITION: 1800Ω ± 5% 1/4 watt	*	RC07GF182J
R3131	RESISTOR, FIXED, COMPOSITION: 9100Ω ± 5% 1/4 watt	*	RC07GF912J
R3132	Same as R3111		
R3133	Same as R3103		
R3134	Same as R3111		
R3135	RESISTOR, FIXED, COMPOSITION: 10,000Ω ± 5% 1/4 watt	*	RC07GF103J
R3136	Same as R3130		
R3137	Same as R3130		
R3138	Same as R3117		
R3139	RESISTOR, FIXED, COMPOSITION: 22,000Ω ± 5% 1/4 watt	*	RC07GF223J
R3140	RESISTOR, FIXED, COMPOSITION: 360Ω ± 5% 1/4 watt	*	RC07GF361J
R3141	Same as R3111		

REFERENCE	DESCRIPTION	MFG.	PART NO.
R3142	RESISTOR, FIXED, COMPOSITION: 47,000Ω ± 5% 1/4 watt	*	RC07GF473J
R3143	Same as R3111		
R3144	RESISTOR, FIXED, COMPOSITION: 2700Ω ± 5% 1/4 watt	*	RC07GF272J
R3145	Same as R3142		
R3146	Same as R3135		
R3147	Same as R3130		
R3148	Same as R3135		
R3149	Same as R3111		
R3150	RESISTOR, FIXED, COMPOSITION: 680Ω ± 5% 1/4 watt	*	RC07GF681J
R3151	Same as R3117		
R3152	RESISTOR, FIXED, COMPOSITION: 39,000Ω ± 5% 1/4 watt	*	RC07GF393J
R3153	RESISTOR, FIXED, COMPOSITION: 200Ω ± 5% 1/4 watt	*	RC07GF201J
R3154	RESISTOR, FIXED, COMPOSITION: 1500Ω ± 5% 1/4 watt	*	RC07GF152J
R3155	Same as R3142		
R3156	Same as R3135		
R3157	Same as R3135		
R3158	Same as R3135		
R3159	Same as R3135		
R3160	Same as R3117		
R3161	Same as R3154		
C3201	CAPACITOR, FIXED, PLASTIC DIELECTRIC: 0.1μf ± 10% 100V	COR	WMF1P1
C3202	Same as C3110		
C3203	CAPACITOR, FIXED, MICA DIELECTRIC: 150pf ± 5% 500V	ARC	CM15C151J
C3204	CAPACITOR, FIXED, CERAMIC DIELECTRIC: 200pf 1200V	CEN	TCN-200, N750

REFERENCE	DESCRIPTION	MFG.	PART NO.
C3206	CAPACITOR, FIXED, MICA DIELECTRIC: 470pf ± 5% 300V.	ARC	CM15C471J
C3207	CAPACITOR, FIXED, ELECTROLYTIC: tantalum 3.3μf ± 20% 15V.	TEX	SCM335FPO-15D4
C3208	Same as C3206		
C3209	Same as C3207		
C3210	Same as C3124		
C3211	CAPACITOR, FIXED, MICA DIELECTRIC: 220pf ± 5% 500V.	ARC	CM15C221J
C3212	CAPACITOR, FIXED, MICA DIELECTRIC: 680pf ± 5% 300V.	ARC	DM15F681J
C3213	Same as C3201		
C3214	CAPACITOR, FIXED, ELECTROLYTIC: tantalum 10μf ± 20% 20V.	TEX	SCM106FPO-20D4
C3215	Same as C3214		
C3216	CAPACITOR, FIXED, MICA DIELECTRIC: 270pf ± 5% 500V.	ARC	CM15C271J
C3217	CAPACITOR, FIXED, MICA: 1000pf ± 5% 100V.	ARC	DM15F102J
C3218	Same as C3110		
C3219	CAPACITOR, FIXED, ELECTROLYTIC: tantalum 6.8μf ± 20% 35V.	TEX	SCM685BPO-35D4
CR3201	Same as CR3102		
CR3202	Same as CR3102		
CR3203	Same as CR3102		
CR3204	Same as CR3102		
CR3205	Same as CR3102		
CR3206	Same as CR3102		
CR3207	Same as CR3102		
CR3208	Same as CR3102		
CR3209	Same as CR3102		
CR3210	Same as CR3102		
CR3211	Same as CR3102		

REFERENCE	DESCRIPTION	MFG.	PART NO.
CR3212	Same as CR3102		
CR3213	Same as CR3102		
CR3214	Same as CR3102		
CR3215	Same as CR3102		
CR3216	SEMICONDUCTOR DEVICE, DIODE: silicone	*	IN660
CR3217	Same as CR3102		
CR3218	Same as CR3102		
CR3219	Same as CR3102		
CR3220	Same as CR3216		
L3201	COIL, RADIO FREQUENCY: variable 110μh to 187μh	JWM	41A154CBI
L3202	Same as L3101		
L3203	Same as L3102		
L3204	CHOKE, RADIO FREQUENCY: 250μh	JAM	J300-250
Q3201	Same as Q3107		
Q3202	Same as Q3101		
Q3203	Same as Q3101		
Q3204	Same as Q3101		
Q3205	Same as Q3103		
Q3206	Same as Q3103		
Q3207	Same as Q3101		
Q3208	TRANSISTOR: PNP, germanium	*	2N1305
Q3209	Same as Q3101		
Q3210	Same as Q3101		
Q3211	Same as Q3101		
Q3212	Same as Q3101		
Q3213	Same as Q3101		
Q3214	Same as Q3103		
Q3215	Same as Q3101		
Q3216	Same as Q3101		

REFERENCE	DESCRIPTION	MFG.	PART NO.
Q3217	TRANSISTOR: PNP, germanium	*	2N1309
R3201	Same as R3111		
R3202	Same as R3106		
R3203	Same as R3117		
R3204	Same as R3121		
R3205	RESISTOR, FIXED, COMPOSITION: 510Ω ± 5% 1/4 watt	*	RC07GF511J
R3206	RESISTOR, FIXED, COMPOSITION: 620Ω ± 5% 1/4 watt	*	RC07GF621J
R3207	Same as R3139		
R3208	Same as R3139		
R3209	Same as R3130		
R3210	Same as R3117		
R3211	RESISTOR, FIXED, COMPOSITION: 13,000Ω ± 5% 1/4 watt	*	RC07GF133J
R3212	Same as R3150		
R3213	RESISTOR, FIXED, COMPOSITION: 560Ω ± 5% 1/4 watt	*	RC07GF561J
R3214	RESISTOR, FIXED, COMPOSITION: 7500Ω ± 5% 1/4 watt	*	RC07GF752J
R3215	Same as R3154		
R3216	Same as R3211		
R3217	Same as R3150		
R3218	Same as R3213		
R3219	Same as R3111		
R3220	RESISTOR, FIXED, COMPOSITION: 22Ω ± 5% 1/4 watt	*	RC07GF220J
R3221	Same as R3121		
R3222	Same as R3111		
R3223	Same as R3111		
R3224	Same as R3117		
R3225	Same as R3135		

REFERENCE	DESCRIPTION	MFG.	PART NO.
R3226	Same as R3213		
R3227	Same as R3213		
R3228	RESISTOR, FIXED, COMPOSITION: 11,000Ω ± 5% 1/4 watt	*	RC07GF113J
R3229	Same as R3111		
R3230	Same as R3213		
R3231	Same as R3121		
R3232	RESISTOR, FIXED, COMPOSITION: 4700Ω ± 5% 1/4 watt	*	RC07GF472J
R3233	Same as R3124		
R3234	Same as R3110		
R3235	RESISTOR, FIXED, COMPOSITION: 3000Ω ± 5% 1/4 watt	*	RC07GF302J
R3236	RESISTOR, FIXED, COMPOSITION: 220Ω ± 5% 1/4 watt	*	RC07GF221J
R3237	Same as R3111		
R3238	Same as R3117		
R3239	Same as R3103		
R3240	Same as R3117		
R3241	Same as R3142		
R3242	Same as R3111		
R3243	Same as R3144		
R3244	Same as R3111		
R3245	Same as R3135		
R3246	Same as R3101		
R3247	Same as R3135		
R3248	Same as R3142		
R3249	Same as R2007		
R3250	Same as R3121		
R3251	Same as R1102		
R3252	Same as R3135		

REFERENCE	DESCRIPTION	MFG.	PART NO.
R3253	Same as R3154		
R3254	Same as R3135		
R3255	Same as R3232		
R3256	Not used.		
R3257	Same as R3232		
R3258	Same as R3232		
C3301	Same as C3110		
C3302	Same as C3110		
C3303	Same as C3110		
C3304	Same as C3110		
C3305	Same as C3110		
C3306	Same as C3110		
C3307	Same as C3110		
C3308	Same as C3110		
C3309	Same as C3110		
C3310	Same as C3110		
C3311	Same as C3110		
C3312	Same as C3110		
C3313	Same as C3110		
C3314	Same as C3110		
C3315	Same as C3110		
C3316	Same as C3110		
C3317	Same as C3110		
C3318	Same as C3110		
C3319	Same as C3110		
C3320	Same as C3110		
C3321	Same as C3110		
C3322	Same as C3110		
C3323	Same as C3110		
C3324	Same as C3110		

REFERENCE	DESCRIPTION	MFG.	PART NO.
C3325	Same as C3110		
C3326	Same as C3110		
C3327	Same as C3106		
C3328	Same as C3110		
C3329	Same as C3110		
C3330	Same as C3110		
CR3301	Same as CR3102		
CR3302	Same as CR3102		
CR3303	Same as CR3102		
CR3304	Same as CR3102		
CR3305	Same as CR3102		
CR3306	Same as CR3102		
CR3307	Same as CR3102		
CR3308	Same as CR3102		
CR3309	Same as CR3102		
CR3310	Same as CR3102		
CR3311	Same as CR3102		
CR3312	Same as CR3102		
CR3313	Same as CR3102		
CR3314	Same as CR3102		
CR3315	Same as CR3102		
CR3316	Same as CR3102		
CR3317	Same as CR3102		
CR3318	Same as CR3102		
CR3319	Same as CR3102		
CR3320	Same as CR3102		
CR3321	Same as CR3102		
CR3322	Same as CR3102		
CR3323	Same as CR3102		
CR3324	Same as CR3102		
CR3325	Same as CR3102		

REFERENCE	DESCRIPTION	MFG.	PART NO.
CR3326	Same as CR3102		
CR3327	Same as CR3102		
CR3328	Same as CR3102		
CR3329	Same as CR3102		
CR3330	Same as CR3102		
DL3301	DELAY LINE: 0.5μsec.	ESC	C5
Q3301	TRANSISTOR: NPN, silicon	*	2N706
Q3302	Same as Q3301		
Q3303	Same as Q3103		
Q3304	Same as Q3101		
R3301	Not used		
R3302	Not used		
R3303	Same as R3213		
R3304	Same as R3111		
R3305	Same as R3144		
R3306	RESISTOR, FIXED, COMPOSITION: 910Ω ± 5% 1/4 watt	*	RC07GF911J
R3307	Same as R3139		
R3308	RESISTOR, FIXED, COMPOSITION: 300,000Ω ± 5% 1/4 watt	*	RC07GF304J
R3309	Same as R2005		
R3310	Same as R3121		
R3311	Same as R2005		
R3312	Same as R2007		
R3313	Same as R3121		
R3314	Same as R2005		
R3315	RESISTOR, FIXED, COMPOSITION: 1600Ω ± 5% 1/4 watt	*	RC07GF162J
R3316	Same as R3121		
R3317	Same as R2005		
R3318	Same as R3235		
R3319	Same as R3121		
R3320	Same as R2005		

REFERENCE	DESCRIPTION	MFG.	PART NO.
R3321	RESISTOR, FIXED, COMPOSITION: 3900Ω ± 5% 1/4 watt	*	RC07GF392J
R3322	Same as R3121		
R3323	Same as R2005		
R3324	RESISTOR, FIXED, COMPOSITION: 5600Ω ± 5% 1/4 watt	*	RC07GF562J
R3325	Same as R3121		
R3326	Same as R2005		
R3327	RESISTOR, FIXED, COMPOSITION: 6800Ω ± 5% 1/4 watt	*	RC07GF682J
R3328	Same as R3121		
R3329	Same as R2005		
R3330	RESISTOR, FIXED, COMPOSITION: 8200Ω ± 5% 1/4 watt	*	RC07GF822J
R3331	Same as R3121		
R3332	Same as R2005		
R3333	Same as R3131		
R3334	Same as R2005		
R3335	RESISTOR, FIXED, COMPOSITION: 10,000Ω ± 5% 1/4 watt	*	RC07GF103J
R3336	Same as R3117		
R3337	Same as R3106		
R3338	Same as R2005		
R3339	Same as R3121		
R3340	RESISTOR, FIXED, COMPOSITION: 51,000Ω ± 5% 1/4 watt	*	RC07GF513J
R3341	RESISTOR, FIXED, COMPOSITION: 100Ω ± 5% 1/4 watt	*	RC07GF101J
R3342	Same as R3110		
R3343	Same as R3308		
R3344	Same as R2005		
R3345	Same as R3144		
R3346	Same as R3236		

REFERENCE	DESCRIPTION	MFG.	PART NO.
R3347	Same as R2005		
R3348	Same as R3121		
R3349	Same as R2007		
R3350	Same as R2005		
R3351	Same as R3121		
R3352	RESISTOR, FIXED, COMPOSITION: 1200Ω ± 5% 1/4 watt	*	RC07GF122J
R3353	Same as R2005		
R3354	Same as R3121		
R3355	Same as R3315		
R3356	Same as R2005		
R3357	Same as R3121		
R3358	Same as R3117		
R3359	Same as R2005		
R3360	Same as R3121		
R3361	Same as R3235		
R3362	Same as R2005		
R3363	Same as R3121		
R3364	Same as R3321		
R3365	Same as R2005		
R3366	Same as R3121		
R3367	Same as R3324		
R3368	Same as R2005		
R3369	Same as R3121		
R3370	Same as R3327		
R3371	Same as R2005		
R3372	Same as R3121		
R3373	Same as R3330		
R3374	Same as R2005		
R3375	Same as R3121		
R3376	Same as R3214		
R3377	Same as R2005		

REFERENCE	DESCRIPTION	MFG.	PART NO.
R3378	Same as R3121		
R3379	Same as R3131		
R3380	Same as R2005		
R3381	Same as R3121		
R3382	Same as R3135		
R3383	Same as R2005		
R3384	Same as R3205		
R3385	Same as R3214		
R3386	Same as R2005		
R3387	Same as R3121		
R3388	Same as R2005		
R3389	Same as R3236		
R3390	Same as R3121		
R3391	Same as R2005		
C3401	CAPACITOR, PAPER DIELECTRIC: 1.5μf 200V.	COR	WMF2W1P5E
DL3401	DELAY LINE: 25.25μ sec. delay, tapped, 560Ω impedance	REG	320130
R3401	RESISTOR, VARIABLE, COMPOSITION: 25,000Ω ± 10% 1/2 watt	*	RV5LAYSB-253A
R3402	RESISTOR, VARIABLE, COMPOSITION: 500,000Ω ± 10% 1/2 watt	*	RV5LAYSB-504A
C4001	CAPACITOR, FIXED, ELECTROLYTIC: 5μf 150V.	SPR	40D212A2
C4002	Same as C3219		
C4003	Same as C3212		
CR4001	SEMICONDUCTOR DEVICE, DIODE: silicon	*	IN663
L4001	COIL, RADIO FREQUENCY: 0.64 to 0.95μh	JWM	4304
L4002	CHOKE, RADIO FREQUENCY: 1.5μh	REG	103206
P4001	CONNECTOR, PLUG, ELECTRICAL: male, coaxial, type BNC	*	UG-88C/U
Q4001	TRANSISTOR: germanium	TEX	2N1908

REFERENCE	DESCRIPTION	MFG.	PART NO.
R4001	RESISTOR, FIXED, COMPOSITION: 470Ω ± 5% 1 watt	*	RC32GF471J
R4002	RESISTOR, VARIABLE, COMPOSITION: 10,000Ω ± 10% 1/2 watt	*	RV5LAYSB-103A
R4003	Same as R2026		
R4004	RESISTOR, VARIABLE, COMPOSITION: 500Ω ± 10% 1/2 watt	*	RV5LAYSB-501A
R4005	RESISTOR, FIXED, COMPOSITION: 150Ω ± 5% 1/2 watt	*	RC20GF151J
V4001	ELECTRON TUBE: triode	EIT	2C39A
Z4001	CAVITY, TUNED: transmitting	REG	330191
RT4001	THERMISTOR: 21Ω	FEN	WB12G1
C5001	CAPACITOR, FIXED, PAPER DIELECTRIC: 0.5μf 1125V./0.5μf 2250V.	GUD	75203
C5002	Same as C3401		
C5003	CAPACITOR, FIXED, PLASTIC DIELECTRIC: 0.1μf ± 10% 100V.	COR	WMF1P1
C5004	CAPACITOR, FIXED, ELECTROLYTIC: 10μf 150V.	SPR	40D106F150-DH4
F5001	FUSE, CARTRIDGE: 4 amp, slow blow, 3AG, 125V.	BUS	MDL
RY5001	RELAY: 12V. coil	POT	KR3D
L5001	CHOKE, RADIO FREQUENCY: 18μh	REG	301-203-3
Q5001	TRANSISTOR: germanium	T.I.	2N441
Q5002	TRANSISTOR: germanium	*	2N1183
Q5003	TRANSISTOR: germanium	*	2N1136A
Q5004	Same as Q5003		
R5001	Same as R4004		
R5002	RESISTOR, FIXED, WIREWOUND: 150Ω ± 10% 5 watt	IRC	PW-5

REFERENCE	DESCRIPTION	MFG.	PART NO.
T5001	TRANSFORMER, POWER: operating frequency, 1325 cps; d-c input to primary, 10.5 volts, feedback winding VIO to WHT/VIO, 11.25 VAC; open circuit secondary a-c voltages; RED to RED, 1100, BLU to WHT/BLU, 680, GRN to WHT/GRN, 360, ORN to WHT/ORN, 39, BRN to BLK, 8.4, WHT/BRN to BLK, 9.2	REG	103197-1(14v) 103197-2(28v)
XF5001	FUSEHOLDER, PHENOLIC: 1/4 in. by 1-1/4 in.	BUS	HKP-EH-JLQ-RW-AA-ZZ
C5101	Same as C3125		
C5102	Same as C3125		
CR5101	SEMICONDUCTOR DEVICE, DIODE: silicon rectifier, PIV 100V. 600ma	SOL	CER68A
CR5102	Same as CR5101		
CR5103	Same as CR5101		
CR5104	Same as CR5101		
CR5105	SEMICONDUCTOR DEVICE, DIODE: zener diode 5.6V. 400mw	*	IN752
CR5106	Same as CR5105		
Q5101	Same as Q3107		
Q5102	Same as Q3107		
Q5103	Same as Q3107		
R5101	Same as R2026		
R5102	Same as R1101		
R5103 (14V.)	RESISTOR, FIXED, COMPOSITION: 220Ω ± 5% 1/2 watt	*	RC20GF221J
R5103 (28V.)	RESISTOR, FIXED, COMPOSITION: 470Ω ± 5% 1/2 watt	*	RC20GF471J
R5104	Same as R1101		
R5105 (14V.)	Same as R5103 (28V.)		
R5105 (28V.)	Same as R1101		
R5106 (14V.)	Same as R5103 (28V.)		
R5106 (28V.)	Same as R1101		
R5107	RESISTOR, FIXED, COMPOSITION: 1200Ω ± 5% 2 watt	*	RC42GF122J

REFERENCE	DESCRIPTION	MFG.	PART NO.
R5108 (14V.)	RESISTOR, FIXED, COMPOSITION: 56Ω ± 5% 2 watt	*	RC42GF560J
R5108 (28V.)	RESISTOR, FIXED, COMPOSITION: 39Ω ± 5% 2 watt	*	RC42GF390J
R5109 (14V.)	Same as R5103 (28V.)		
R5109 (28V.)	Same as R1101		
R5110	RESISTOR, FIXED, COMPOSITION: 10Ω ± 5% 1 watt	*	RC32GF100J
R5111	Same as R5110		
R5112	RESISTOR, FIXED, COMPOSITION: 620Ω ± 5% 1/2 watt		RC20GF621J
CR5201	SEMICONDUCTOR DEVICE, DIODE: silicon rectifier	SOL	CER 72A
CR5202	Same as CR5201		
CR5203	Same as CR5201		
CR5204	Same as CR5201		
CR5205	Same as CR5201		
CR5206	Same as CR5201		
CR5207	SEMICONDUCTOR DEVICE, DIODE: silicon rectifier	SOL	CER 70A
CR5208	Same as CR5207		
CR5209	Same as CR5207		
CR5210	Same as CR5207		
R5201	RESISTOR, FIXED, FILM: 270,000Ω ± 5% 1 watt	*	RC32GF274J
R5202	Same as R5201		
R5203	Same as R5201		
R5204	Same as R5201		
R5205	Same as R5201		
R5206	Same as R5201		
R5207	Not used		
R5208	RESISTOR, FIXED, COMPOSITION: 820Ω ± 5% 1 watt	*	RC32GF821J

REFERENCE	DESCRIPTION	MFG.	PART NO.
DS6001	LAMP: 5V., .08a	GEC	DIM265-1-3A
DS6002	LAMP: 5V., .06a	GE	680
DS6003	Same as DS6002		
DS6004	Same as DS6002		
DS6005	Same as DS6002		
DS6006	Same as DS6002		
DS6007	Same as DS6002		
J6001	CONNECTOR, RECEPTICAL, ELECTRICAL: female, 37 contacts	CAN	DC-37P
P6001	CONNECTOR, PLUG, ELECTRICAL: male, 37 contacts	CAN	DC-37S
S6001	SWITCH, PUSH: SPST normally open	GRA	39YY2023
S6002	SWITCH, TOGGLE: SPST	CCA	T3103
S6003	Same as S6001		
S6004	SWITCH, ROTARY:	GAB	A2183-1
S6005	Same asS6004		
S6006	Same as S6004		
S6007	Same as S6004		
S6008	SWITCH, ROTARY:	GAB	A3628-A1
S6009	Same as S6008		
Fig. 12 & 13	PRINTED CIRCUIT BOARD ASSY.: 3100	REG	103274
Fig. 14 & 15	PRINTED CIRCUIT BOARD ASSY.: 3200	REG	103273
Fig. 16 & 17	PRINTED CIRCUIT BOARD ASSY.: 3300	REG	103272
Fig. 18	PRINTED CIRCUIT BOARD ASSY.: 5100	REG REG	103271-1(14V) 103271-2(28V)
Fig. 19	PRINTED CIRCUIT BOARD ASSY.: 5200	REG	103275
Fig. 20	POWER SUPPLY REGULATOR BRACKET ASSY.	REG	500-672
Fig. 21	POWER SUPPLY TRANSFORMER BRACKET ASSY.	REG REG	500-671-1(14V) 500-671-2(28V)
Fig. 22	PRESELECTOR AND LOCAL OSCILLATOR ASSY.	REG	103351
Fig. 23	MODULATOR BRACKET ASSY.	REG	103590
Fig. 24	I.F. ENCLOSURE ASSY.	REG	103053

WARRANTY

This Transponder is sold under an exclusive 1-year warranty, which warrants it to be free from defects in material and workmanship. We agree to repair or replace at the point of manufacture, without charge, all parts showing such defects, provided the unit is delivered to us, intact for our examination, with all transportation charges prepaid to our factory, within one year from the date of sale to the original purchaser, and provided such examination discloses in our final judgment, that it is thus defective. Pilot lights, tubes, transistors, fuses, and diodes shall be covered by the manufacturer's standard EIA warranty and such items shall be excluded from the provisions of this warranty.

This warranty does not apply if the Transponder has been subjected to misuse, neglect, accidents, incorrect wiring not our own, improper installation, or put to use in violation of instructions furnished by us, nor to Transponders that have been damaged by lightning, excess current, repaired or altered outside our factory, nor to the Transponder that has had its serial number altered or removed.

CHANGES

The Company reserves the right to modify or change the equipment, in whole or in part, at any time prior to delivery in order to include refinements deemed appropriate by the Company, but without incurring any liability to modify or change any equipment previously delivered, or to supply new equipment in accordance with earlier specifications.

FCC APPROVED

Technical support data for the Regency Model 505 Transponder are on file with the Federal Communications Commission and may be so designated on application Form FCC-404.